JULY 1992
VOLUME FIVE NUMBER FIFTEEN
SEVEN DOLLARS

CIO

THE MAGAZINE FOR INFORMATION

COVER STORY:

The World According To AARP

ALSO INSIDE:

A CIO's Guide To GUIs

The American Association of
Retired Persons' Steve Cablk

AN INTERNATIONAL DATA GROUP PUBLICATION

Managing a network is a lot like being in show biz. When the spotlight's on, you and the network have to perform.

At Digital, we've developed networking capabilities and applied standards in a way that will make you a star, earning you rave reviews from even the toughest critics.

We call these capabilities ADVANTAGE-NETWORKS™ software, a standards based approach to networking that lets you define, create and expand the ultimate open network.

The premise behind ADVANTAGE-NETWORKS is surprisingly simple. You want, and need, the freedom to choos the technologies, features an solutions that best suit you company's requirements.

The performance, however, is brilliant. For starters, ADVANTAGE-NETWORKS

DIGITAL OPENS NETWORK PERFORMANCE

NAS FROM DIGITAL.

© DIGITAL EQUIPMENT CORPORATION 1991. THE DIGITAL LOGO, ADVANTAGE-NETWORKS AND DECnet ARE TRADEMARKS OF DIGITAL EQUIPMENT CORPORATION

FROM TOP TO BOTTOM.

support OSI, TCP/IP, and DECnet™ software. Which means you can create your open network today. With systems you already have in place.

Then you can use that network with little effort. Thanks to Network Application Support (NAS), a comprehensive implementation of application standards that makes it possible to write a program but once, and have it run across any CPU, operating system or continent. This gives users not only a clear view of all of their network resources and applications but easy access to them.

You'll find the benefits instantly obvious. But more importantly you'll see them magnified over time. Because the same tireless commitment to standards and de facto standards that produced ADVANTAGE-NETWORKS in the first place will continue to apply as new solutions, technologies and standards emerge, assuring that you enjoy freedom to change and expand your network in the future.

Ask some other companies if they can offer you flexibility and performance like this and you'll get a song and dance. Talk to Digital and you'll see that we really have our act together.

digital™

THE OPEN ADVANTAGE.

CIO

VOLUME 5, NUMBER 15

Older and wiser
Cover photo by Katherine Lambert **48**

COVER STORY

Mature Technology

48

The American Association of Retired Persons combines young technologies and seasoned volunteers to create a potent political force.

By Meghan O'Leary

Buying the IS group **30**

FEATURES

For Sale: One Cost Center, Slightly Used

30

Libbey-Owens-Ford's CIO liked the IS group so much, he bought it.

By Richard Pastore

More than Just a Pretty Interface

38

A good graphical user interface may provide the most effective means to order and control increasingly complex volumes of data. In doing so, it makes users significantly more productive.

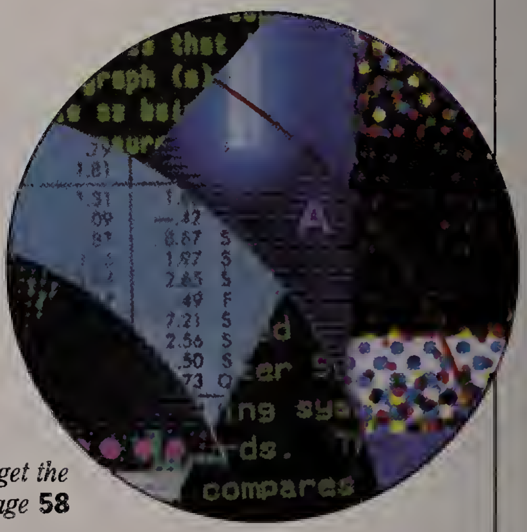
By Mickey Williamson

IT and the Powers That Be

58

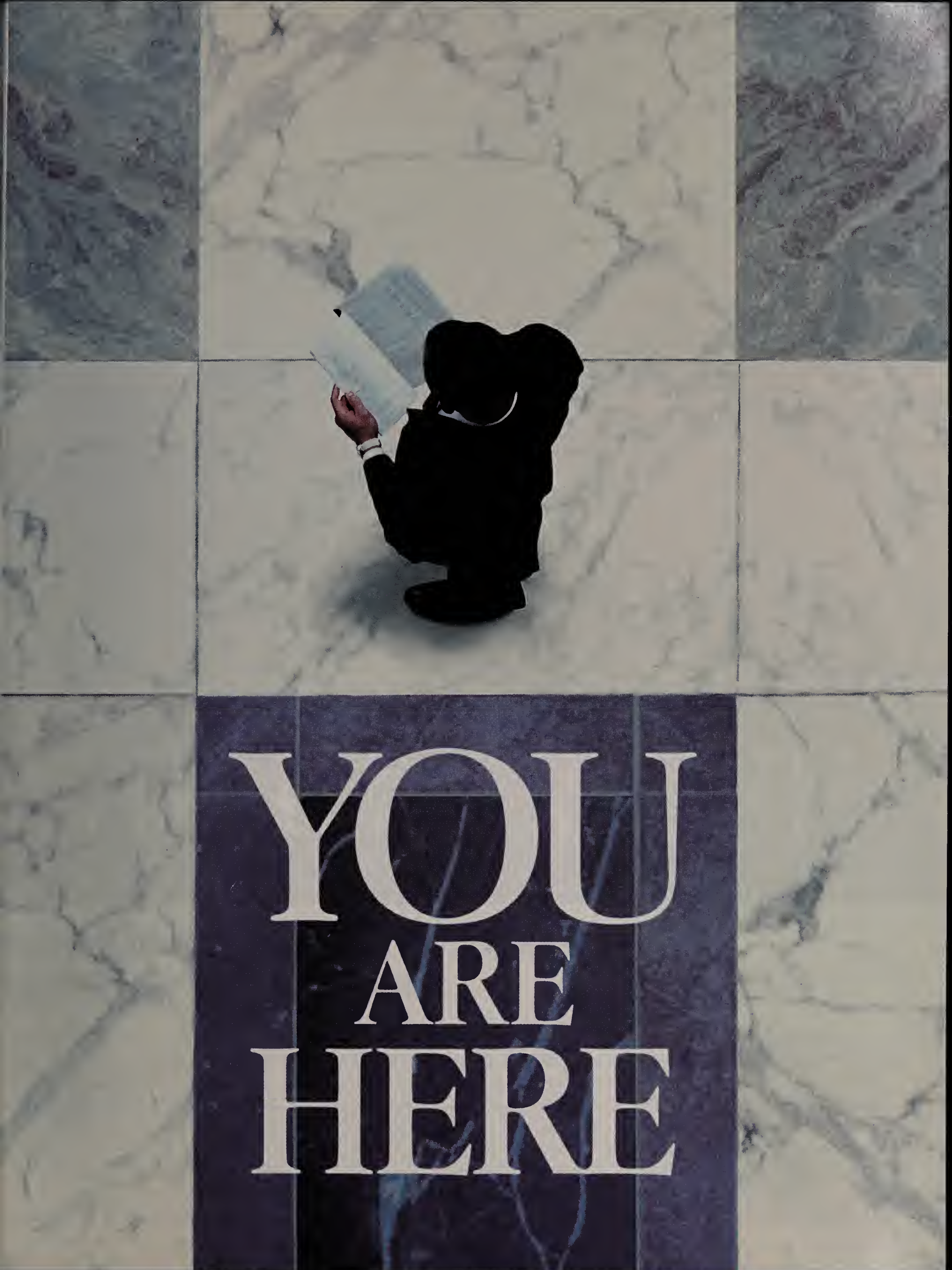
It used to be that only radio and television were considered "electronic." Now all the media are beginning to swirl together in a vast electronic soup. Doing the stirring is information technology, enabling increasingly customizable recipes for messages.

By Kathleen Melymuka



The media get the message **58**

MORE ▶▶▶



YOU ARE HERE

No Problem. AT&T InterSpan℠ Frame
and all your people to al

If you're going to outperform the competition these days, you've got to have your information in the right place at the right time. AT&T **InterSpan** Frame Relay Service is based on a new network technology that handles information going to many locations at high speeds. Quickly, reliably and economically.

Whatever you're doing, from distributed order and information processing to multimedia and image transfer, **InterSpan** Frame Relay Service can improve your productivity and help you service your customers better.

And because one size does not fit all, we work with you to design the exact frame relay solution your particular business needs.

InterSpan Frame Relay Service is backed by a dedicated staff, the technical expertise of AT&T Bell Laboratories and global support for internetworking domestic and international applications.

As your needs evolve, **InterSpan**

© 1992 AT&T

Relay Service links all your locations
the information they need.

Frame Relay Service can change with you. And since it works with multiple protocols and different vendors' equipment, you can have the benefits of frame relay while protecting your existing investment.

It's all part of the **InterSpan** Data Communications Services family of high-quality, innovative data connectivity solutions designed to make it easier to link people, locations and information. We work with you to meet your exact business needs.

To find out more about the data-moving technology that's moving productivity ahead, call your AT&T Account Executive or 1 800 247-1212, Ext. 621.

AT&T
The right choice.

CIO

COLUMNS

OUTLOOK: A MISGUIDED EFFORT 22

Trying to evaluate the bottom-line contribution of IS is a waste of time.
By Robert A. Waldman

INSIGHTS: A WORLD OF DIFFERENCE 25

Computer manufacturers in the East and West agree on the importance of achieving quality in all facets of their businesses. But on the question of how to go about it, the twain don't meet.
By L. Scott Flaig

FRONTLINE 64

The coming generation of personal computing and communications devices should be dubbed "MCs," for both "mobile computers" and "mobile communicators."
By Portia Isaacson

WORKING SMART 72

Commercial editors at CBS were spending as much time fielding phone calls from ad agencies as they were editing copy. An interactive voice-response system keeps anxious agency personnel apprised of their materials' status while letting editors get on with the business at hand.
By Megan Santosus

A global concern **25**

The value trap **22**

DEPARTMENTS

Editor's Letter 10

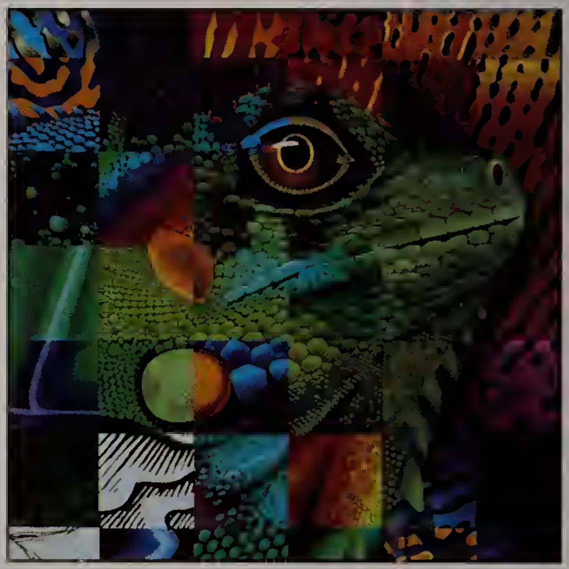
Publisher's Letter 12

Trendlines 14
- Phone futures
- Electronic-art contest
- IT in health care
- Computer bowl
- Printing glossary
- The CEO road
- Manager of the Year
- Donations wanted
- Career moves

Index 70

FYI 71

Modern masters **14**



THERE ARE TWO PLACES WHERE COMPLEX NETWORK INTEGRATION PROBLEMS CAN BE WORKED OUT.

YOUR PLACE

As surprising as it may seem, there are many clone companies that boost profit margins by not hiring enough designers and doing dangerously little testing. What does it all mean? It means that your network is the unofficial test site for their server.

Introducing the design and testing engineers of our Systems Division at Compaq headquarters in Houston, Texas.

These are the same people who built our reputation for developing the servers of choice in the computer industry.

In fact, in a recent survey, the readers of *LAN Times* selected COMPAQ 386- and 486-based file servers over all others – IBM, Northgate, Dell and AST included – for the second year in a row.

Becoming this good requires months of rigorous network testing. This process – which we believe has no equal in the entire PC server industry – is referred to affectionately as "The Meat Grinder."

© 1992 Compaq Computer Corporation. All rights reserved. Printed in the USA. COMPAQ, SYSTEMPRO Registered U.S. Patent and Trademark Office. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. *This limited warranty service is provided by contract Service

OR OURS.

Virtually every kind of test is run using literally hundreds of different applications, configurations and cards. Running on the world's four most popular network operating systems.

But to be perfectly honest, not all development and testing takes place at our place.

Because the engineers at Novell, SCO, Microsoft and Banyan—in long-standing technical alliance with Compaq—work to make sure you get both the easiest integration and highest performance possible.

Unfortunately, those engineers were unable to make it to the above photo session.

Nor could the specialists who created the COMPAQ ToolKits and TechNotes—the industry's most sought-after guides for multi-vendor network integration.

Or the thousands of technicians who provide you with a full year of free, on-site service.*

Or the experts who staff our free technical support line, resolving 95% of your questions in 15 minutes or less.

For more information about everything Compaq has to offer, just call. 1-800-345-1518, ext. 200 in the U.S.A.

And in Canada call 1-800-263-5868, ext. 200.

When it comes to PC server-based computing, you'll see there's really only one place to go.

The new enhanced COMPAQ SYSTEMPRO models feature the latest drive array controller, dramatically increasing I/O throughput.

The COMPAQ Server Manager/R lets you monitor and diagnose your server remotely. In the event of a problem, it calls your beeper—preventing any downtime before it happens.

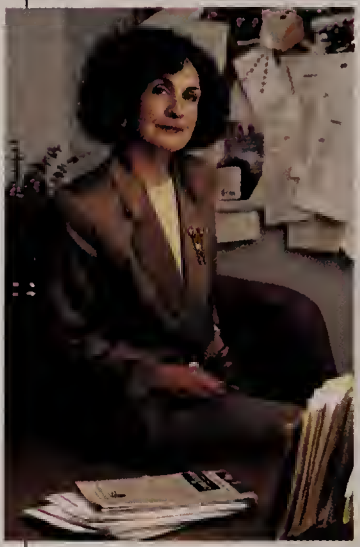
NOVELL SCO Microsoft BANYAN

Our key technical alliances with major operating systems ensure optimum performance and support of your PC network.

COMPAQ

Providers and may not be available in certain geographic locations. Consult Compaq Customer Support Center for further details.

LETTER FROM THE EDITOR



Making it easier for people to interact with computer applications has been a long-standing goal of IS executives. "User-friendly" was a term marketers coined to tempt information executives to buy their products. Today's explosive growth in the graphical user interface (GUI) market indicates that user-friendliness still matters.

But a GUI is only as good as its design. And they don't come cheap. Like other technologies, they are a major investment that CIOs have to sell to top management. A GUI can take up half the code of an application, so the improvement in usability had better reach 100 percent. Our story "More than Just a Pretty Interface," beginning on Page 38, puts some perspective on the human factors and design issues related to creating GUIs.

Senior Writer Meghan O'Leary's article profiling the American Association of Retired Persons (AARP) shows how a nonprofit organization uses IT as a means of becoming one of the most powerful lobbying groups in the country (please see "Mature Technology" on Page 48). And in an unusual twist on an outsourcing theme, Senior Writer Richard Pastore reports how Libby-Owens-Ford sold its IS operation to its own information director ("For Sale: One Cost Center, Slightly Used," Page 30).

In August we will publish our fifth annual CIO-100. This year we are focusing on high performance, honoring companies that are not only profitable but also highly effective in a chilly business climate. Special Projects Editor Allan E. Alter and Senior Writer Thomas Kiely plotted this year's special issue.

Marcia Blumenthal

P.S. Our first issue of 1993 will feature companies that have been able to demonstrate the bottom-line result of aligning IT solutions with the enterprise's strategies. We invite our readers to participate. Guidelines for submissions are on Pages 23 and 24.

Aligning IT with corporate goals is seen by many as the top challenge facing CIOs. Here's your chance to show that progress is being made on this front.

PHOTO BY WEBB CHAPPELL

CIO

© By CIO Publishing Inc.

Publisher/Editorial Director	Joseph L. Levy
Editor-In-Chief	Marcia Blumenthal
Managing Editor	Lew McCreary
Art and Design Director	Mary Lester Marshall
Special Projects Editor	Allan E. Alter
Associate Editor	Abbie Lundberg
Associate Editor	Leigh Buchanan
Senior Writer	Thomas Kiely
Senior Writer	Meghan O'Leary
Senior Writer	Richard Pastore
Writer/Researcher	Megan Santosus
Assistant Art Director	Moira Gillis
Design Associate	Kim Morneau
Editorial Assistant	Mina C. Ahn
Director of Marketing	Cathy O'Leary Hayes
Production Director	Lori Beth Sadewitz
Director of Finance & Admin.	Nancy A. Bryson
Assistant to the Publisher	Diane Martin
Circulation Director	Carol A. Spach
Fulfillment Manager	Susan Woodworth
Sales & Marketing Specialist	Bridget Cammarata
Sales and Marketing Assistant	Dot Caspersen
Marketing Intern	Stephen Irving
Circulation Assistant	Beverly Bigham
Administrative Assistant	Lynn J. Palmquist
VP/GM, Executive Programs	Lynda Rosenthal
Executive Program Manager	Walter Manninen

Contributing Writers
L. Scott Flaig, Portia Isaacson, Kathleen Melymuka,
Robert A. Waldman, Mickey Williamson

Contributing Art/Editorial Assistant
Margaret Thom

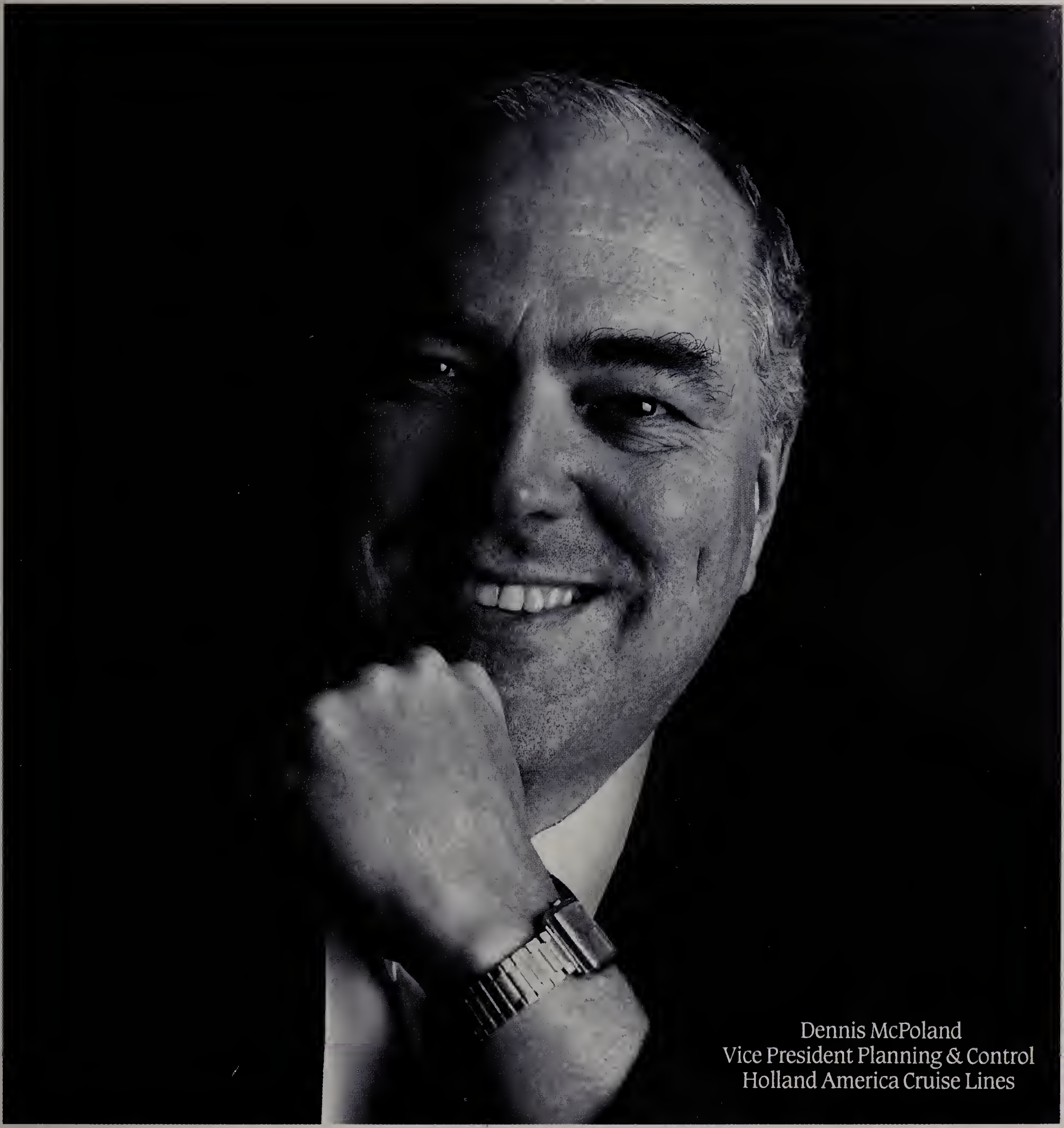
Editorial Offices
CIO Publishing Inc., 492 Old Connecticut Path,
P.O. Box 9208, Framingham, Mass. 01701-9208
(508) 872-8200.

Subscriber Services
(800) 788-4605.

International Data Group

Board Chairman	Patrick J. McGovern
President	Walter Boyd
Executive Vice President	William P. Murphy

BPA



Dennis McPoland
Vice President Planning & Control
Holland America Cruise Lines

"To me, service and support are the two most important words in this business. And CA agrees. I don't know any vendor, hardware or software, that does as much today to help its clients as CA does."

CA90s
CA's Computing Architecture For The 90s.

Around the clock. And around the world. We give our clients the most comprehensive and responsive service and support in the industry. It's one reason why more than 95% of the Fortune 500 choose CA software. They know that in times like these, service and support is more important than ever.

And we couldn't agree more.

COMPUTER® ASSOCIATES
Software superior by design.

© Computer Associates International, Inc., One Computer Associates Plaza, Islandia, NY 11788-7000 1-800-CALL CAI

PHOTO BY GEORGE SIMIAN

> *"One area of specialization that I'm particularly skeptical of is computers."*
>
> *—Lee Iacocca*
> *Chairman*
> *Chrysler Corp.*

Mr. Iacocca is not the only CEO in corporate America who is skeptical of information systems. The number-one problem facing information executives is demonstrating and communicating to top management the return on investment from information technology (ROIT).

Peter Drucker has said that information is the responsibility of everyone in a company. Those companies that survive and thrive have leaders who understand the nature of information—their information requirements, the form it should take and who else needs to have it.

Obviously computer technology enables the management and delivery of information to people, regardless of their location. The day CIOs can furnish the direct connection between IT and the bottom line is the day CEOs will find technology-driven solutions to their business problems.

To demonstrate the bottom-line value of IT, *CIO* magazine will focus on ROIT in our January 1993 issue. We seek your input in the form of case histories and success stories that document systems and/or applications that have been created and implemented with proven, tangible, bottom-line benefits for your organization.

We look forward to sharing your success stories with *CIO* readers.

P.S. Please join us at the next CIO Perspectives conference, "The Process of IT: Organizing for Success," Oct. 11-14 at the Boca Raton Resort & Club in Boca Raton, Fla. For more information, call 800 366-0246.

Coming In CIO

• • • • • • • • • • • • • • • • • • • •

High-Performance CIO-100

In this year's CIO-100, we honor the nation's most effectively run organizations and explore IT's contribution to their achievements. Information is a staple of high-performance shops; successful CIOs pay keen attention to tailoring the platform to fit their company's shape, culture and mission. We also offer a profile of Wal-Mart, one of retail's true superstars. Altogether, the CIO-100 offers a provocative look at what it takes to be effective at a time when performance is at a premium.

• • • • • • • • • • • • • • • • • • • •

A Multitalented Messenger

E-mail systems are being used to transmit graphics, software, order forms and other materials between individuals and applications. New interfaces will enable users to send information directly from within their applications, without exiting to E-mail.

• • • • • • • • • • • • • • • • • • • •

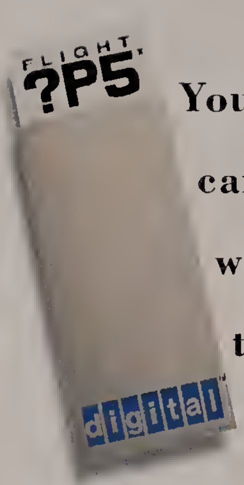
Small Companies, Big Risks

CIOs must frequently gamble mission-critical systems on untested products, either to achieve a modicum of competitive advantage or simply because nothing more venerable exists. Thankfully, there are several strategies, some common and some crafty, to help minimize the risks and maximize the rewards.

Introducing the World's First Unrestricted Flight to ?P5*
digital™

Digital's Upgrada

we take you all



You wouldn't want to board a plane that can't take you where you need to go. So why buy a PC "upgradable" that can't go the distance?

Only Digital™ has the technology and engineering expertise to land you safely in ?P5* territory today. Thanks to our exemplary and industry-standard upscalable Xpress EISA architecture, the ?P5* will fit every 400ST Series PC like they were made for each other.

After all, they were made for each other.

While all those other "upgradables" will leave you waiting around for some add-on that hasn't been designed yet. Or emptying out and rebuilding the PC altogether.

We don't just outperform other PCs. We help them catch up.
For all their big talk, other PC companies' service claims are equally airborne. Not Digital's. We've got over 10,000 of our own service people across the country. Ready to deliver on-site service that's not a glorified messenger service. And ask about our Multivendor Support which covers your PCs from vendors such as Apple®, Compaq®, AST, Dell® or IBM® — as well as software from Microsoft®, Novell® and Lotus®, to name a few.

There's no sticker shock with Digital — compare their "options" with our standard features.
Shipping is included. (Ask what they charge.) Lifetime Technical Support. 24-hour FAX Support. And a 30-Day Money Back Guarantee. And in the unlikely event something should ever go wrong with a 400ST model or any personal computer from Desktop Direct™, you'll benefit from our no-fine-print On-Site Service for one full year after purchase — at no additional charge.

Every Digital Notebook comes with a One-Year Return-to-Factory Service Warranty, Telephone Support and unlimited repairs, as well as our 30-Day Money Back Guarantee and a 24-hour FAX line!

ble 400ST Series

the way there

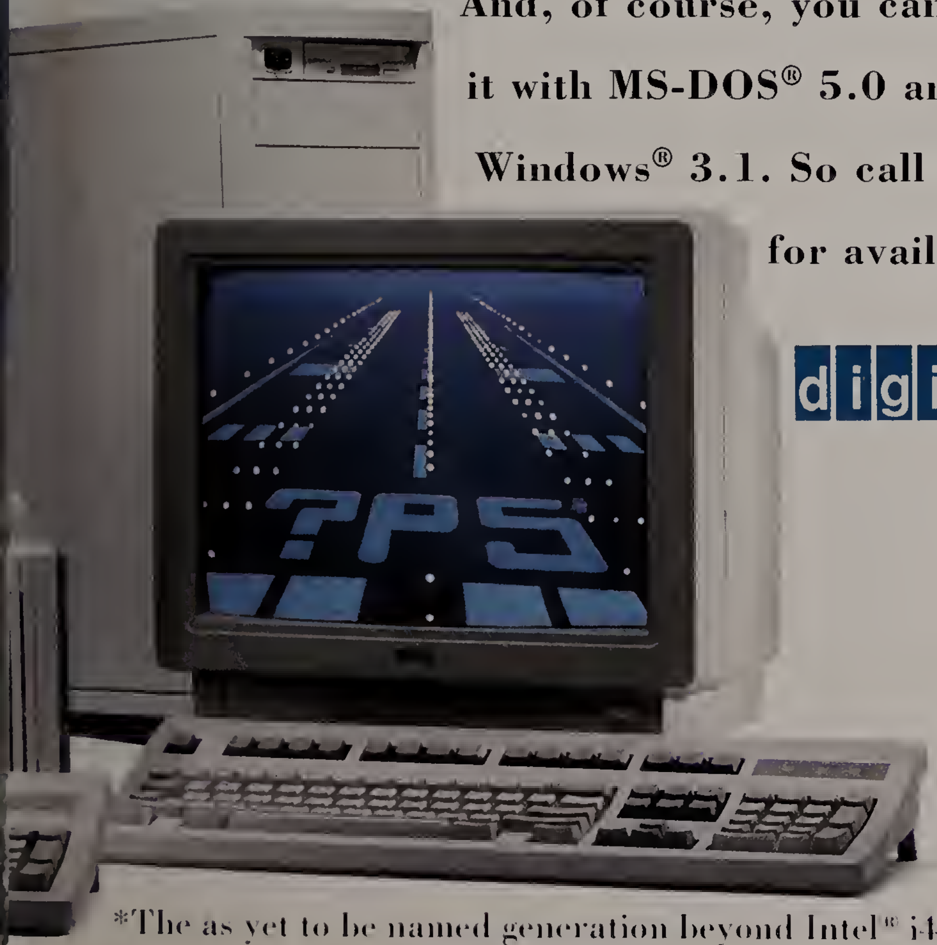
Why crash and burn with an upgradable that runs out of gas?

Soar with Xpress EISA today: Our DECpc 450ST sets the pace with its i486dx, 50MHz processor. And because Digital can configure it for you as a single user system or a powerful network server, it can take you where you want to go, the way you want to get there.

No matter which Digital model you choose, we can customize your system with memory from 4MB to 192MB and hard disk storage ranging from 105MB IDE to 852MB SCSI — or more. Six EISA Bus Master slots support state-of-the-art standard VGA monochrome to powerful color resolution of 1280 x 1024.

soar with Xpress EISA

And, of course, you can have it with MS-DOS® 5.0 and Windows® 3.1. So call us now for availability.



digital™

*The as yet to be named generation beyond Intel® i486.

Purchase one PC and get a service team of 10,000.

When you buy from Desktop Direct from Digital, you get the world's second largest computer company as co-pilot. 10,000 of us in fact. On staff, fully trained and ready to arrive with any equipment necessary. We can even be there to help when you need training or special classes.

What's more, Digital's acclaimed engineers are always available to help you navigate through all your information technology. Installation, systems integration, networking expertise — all together in one experienced, reliable crew. The way only Digital can do it.

Flight check

Before you take off for ?P5*, check these features — all included by Desktop Direct — at no extra charge!

- One-Year On-Site Service with No Fine Print
- Lifetime Technical Support
- 30-Day Money Back Guarantee
- 24-hour FAX Support
- Electronic Connection for Electronic Ordering
- Shipping

The DIGITAL logo, DECpc and Desktop Direct are trademarks of Digital Equipment Corporation. i386sx, i486dx and Intel are trademarks of Intel Corporation. Windows and DOS are trademarks and Microsoft and MS-DOS are registered trademarks of Microsoft Corporation. Apple is a registered trademark of Apple Corporation. Dell is a registered trademark of Dell Corporation. IBM is a registered trademark of International Business Machines Corporation. Lotus, 1-2-3, and Agenda are registered trademarks of the Lotus Development Corporation. Ami Pro is a registered trademark of Samna Corporation, a wholly owned subsidiary of Lotus Development Corporation.

Desktop Direct from Digital

the shortest route to big time savings!

DECpc 450ST

DJ-PCT25-01

Microprocessor: Intel® i486 running at 50MHz

Memory: 4MB — expandable to 192MB

Storage: 105MB IDE 3.5", 1.44MB Floppy

Display: 14" Monochrome Monitor (resolution 640 x 480)

Video Adapter: SVGA+ (supports up to 1024 x 768, 256 colors)

Keyboard: 101-key enhanced

Mouse: 3-button

Operating System: MS-DOS 5.0 and MS-Windows 3.1

Includes: Shipping, One-Year On-Site Service, Lifetime Technical Support, 24-hour FAX Support, 30-Day Money Back Guarantee

Special Price: **$5,399**

Selected Options: 852MB disk with high performance EISA SCSI Adapter • 16" Multi-sync VGA Color Monitor with Video RAM upgrade to 1MB, add $2,400 • 8MB RAM (to 12MB), add $400 • 1.2MB 5.25" Floppy Drive, add $75 • Many other options available.

DECpc 433ST

DJ-PCT20-01

Microprocessor: Intel i486 running at 33MHz

Memory: 4MB — expandable to 192MB

Storage: 105MB IDE 3.5", 1.44MB Floppy

Display: 14" Monochrome Monitor (resolution 640 x 480)

Video Adapter: SVGA+ (supports up to 1024 x 768, 256 colors)

Keyboard: 101-key enhanced

Mouse: 3-button

Operating System: MS-DOS 5.0 and MS-Windows 3.1

Includes: Shipping, One-Year On-Site Service, Lifetime Technical Support, 24-hour FAX Support, 30-Day Money Back Guarantee

Special Price: **$4,199**

Selected Options: 852MB disk with high performance EISA SCSI Adapter • 16" Multi-sync VGA Color Monitor with Video RAM upgrade to 1MB, add $2,400 • 8MB RAM, add $400 1.2MB 5.25" Floppy Drive, add $75. • Many other options available.

Buy any Digital PC and get an application at no extra charge!

You've got your pick of any one of these popular programs when you fly Digital. But hurry: Offer is limited. And ask about our Lotus SmartSuite™ for Windows promotion!

	Retail value		Retail value
Lotus 1-2-3® for Windows™ [1]	$595	**Lotus 1-2-3 version 3.1+**	$595
Lotus Ami Pro™ 2.0 [1]	$495	**Lotus 1-2-3 version 2.4**	$495
Lotus Works™ 3.0	$149	**Lotus Freelance for DOS**	$495
Lotus Freelance Graphics™ for Windows [2]	$495	**Lotus Agenda® 2.0**	$199

[1] Requires Microsoft Windows, i1386 processor or higher, and 3MB of memory. [2] Requires Microsoft Windows, i1386 processor or higher, and 2MB of memory.

To order, just call. and don't forget to ask about our complete line of software, accessories and peripherals.

Desktop Direct™ FROM Digital

1-800 PC BY DEC

(1-800-722-9332) Please reference ATB when you call.
Mon.-Fri. 8:30am to 8:00pm (ET)

digital™

Low
Fares.

Superior
Service.

Xpress to
?P5.*

FAX Forward!

FAX toll free to 1•800•524•5694

and we'll send you a special system recommendation.
Or call 1-800-722-9332 and we'll recommend by phone!

Your Name..
Title..
Company Name..
Address..
City, State, Zip..
Your Telephone No............................ Your FAX No...............................

Contact me regarding:

For:	Home	Business	Resale
○ DECpc i486 and i486sx based systems	....	....	....
○ DECpc i386 and i386sx based systems	....	....	....
○ The DECpc 320P Notebook	....	....	....
○ The Desktop Direct Catalog	....	....	....

Choosing the right PC made simple:

I am interested in a:
.......i386 ....i486 .... Other .... Not Sure
How many applications will your PC(s) run in a typical workday?
How many PCs do you anticipate purchasing over the next 12 months?.........
Are you interested in leasing? ....Yes .... No
.... Immediately .... 1 - 3 months
.... 3 - 6 months .... 6 - 12 months

What best describes the type of work the system will be used for? (Check all that apply)

○ Word Processing
○ Database (filing records)
○ Retail Store Management
○ Education
○ Engineering
○ Scientific Research
○ E-Mail
○ Order-entry
○ Financial Calculations
○ Desktop Publishing
○ Design (CAD/CAM)
○ Industrial Process Control
○ Software Development
○ Other industry-specific applications (please specify)

Which of these graphics-oriented applications best describes your needs? (Check all that apply)
○ Desktop Publishing ○ CAD/CAM ○ Animation
○ Realtime Modeling ○ Image Processing
○ AutoCad ○ Business Graphics

How many people work in your group, department or small business?
○ Less than 10 ○ 10-20 ○ 20-35 ○ More

Is your desktop operating system:
○ DOS ○ DOS with Windows ○ OS/2
○ MAC ○ UNIX™
○ VMS ○ Other

LAN Communication:

How many PCs do you have installed?.......................................
From how many manufacturers?.......................................
What kinds of connections does your PC(s) require? (Check all that apply)
○ Links with other PCs in the immediate surroundings
○ Connection to the local area network (LAN) throughout a building
○ A line to a host system in a remote location
What kind of media (cable) is used in your LANs today?...............
What is the networking software now being used in your company
....
What kind of host system will your PC communicate with?
○ Digital ○ IBM ○ Other.......................................

What kind of service do you need?

○ On-Site Hardware Support ○ Software Support
○ Telephone Support ○ Training
○ FAX Hotline

How many of your users take portables on the road? ..
Do you currently have a service contract(s) for your PCs?
○ Yes ○ No
How many?........................
Does your service provider offer Multivendor Support?
○ Yes ○ No

DesktopDirect™ FROM Digital

1-800 PC BY DEC

(1-800-722-9332) Please reference ATB when you call.
Mon.-Fri. 8:30am to 8:00pm (ET)

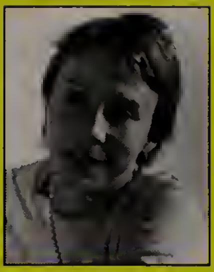
digital™

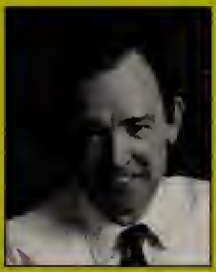
See Digital's other ads in this issue. Circle Reader Code!

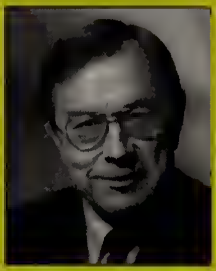
LET'S TALK GROUPWARE!

FEATURED SPEAKERS

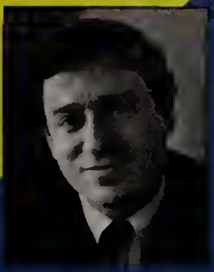
Daniel Petre
G.M. Workgroup Applications Division
MICROSOFT

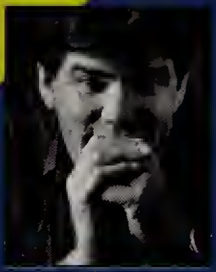

Esther Dyson
Editor and Publisher, RELEASE 1.0


Ron Whittier
V.P. Software Technology, INTEL


Raymond J. Noorda
President and CEO
NOVELL

Keynote Speaker


JIM MANZI
President and CEO
LOTUS


Philippe Kahn
Chairman, President and CEO
BORLAND INTERNATIONAL

David Stone
V.P. Software Products Group
DIGITAL

OTHER FEATURED SPEAKERS

Dr. Terry Winograd
Professor of Computer Science
STANFORD UNIVERSITY

Ronni T. Marshak
V.P., Editor-in-Chief
OFFICE COMPUTING REPORT

Susanna Opper
Co-author, TECHNOLOGY FOR TEAMS: ENHANCING PRODUCTIVITY IN NETWORKED ORGANIZATIONS

Dr. Douglas Engelbart
Director, BOOTSTRAP INSTITUTE
The "father of groupware"

Dr. Thomas Malone
Professor of Information Systems
MIT Sloan School of Business

JOIN US AT GROUPWARE '92

- Be a part of the exploding 2 billion dollar groupware industry at GroupWare '92.
- Learn how to use your new network and increase your organization's productivity.
- Network with other groupware users, vendors and developers.
- See over 100 of the hottest new workgroup products of 1992.
- Receive all papers and proceedings.
- Five conference tracks, over 50 sessions, covering groupware standards, development, implementation, technology, management and applications issues, and a user experience track.
- Five tutorial tracks, Sunday August 2nd
- GroupWare '92 fees:

Full conference & exhibits package	$795
Tutorials with full conference	$195
Tutorials only	$295
(above packages include lunch and special events)	
Exhibits only (FREE pre-registered)	$ 25

- Special group discounts available.

Lotus®
Official Co-Sponsors of GroupWare '92
Presented by The Conference Group

SRI International®

Sponsor Publication of GroupWare '92

CIO®

The First Commercially Oriented Groupware Conference/Exhibition

GROUPWARE '92

August 3rd-5th, 1992
San Jose, California

CONFERENCE TOPICS (Partial Listing)

- Integrating groupware into corporate cultures
- Meetings in the year 2000
- Making Groupware pay - financial benefits & deficiencies of groupware
- Multimedia and groupware
- GUI design for groupware
- E-mail standards and issues
- Telecommuting
- Workflow and decision support
- Implementation strategies
- Database foundations for groupware
- The legal issues of groupware

and much, much more...

PROPOSED TUTORIAL TOPICS

- Strategic planning for management teams
- Successful development of group decision support systems
- Groupware: what it is and what it can accomplish
- Collaborating in a competitive environment
- Notes application development
- Microsoft workgroup products
- Groupware for creativity
- Group creativity skills
- Groupware GUI's: Evaluating your development options
- Workflow and groupware

Exhibit space is available at $20 per square foot. For more information on exhibiting at, or attending GroupWare '92, contact:

The Conference Group
9875 N. 111th Place
Scottsdale, AZ 85259
602/661-1260 Fax 602/661-0449

WHO SHOULD ATTEND?

- MIS and Departmental Managers
- Network Administrators
- Corporate Information Officers
- Groupware Applications Developers
- Network Oriented Systems Integrators
- Corporate Executives Interested in Increasing Productivity Through Computer Based Collaboration
- Designers and Engineers with Large, Group-Oriented Projects
- Industry Analysts and Press People

Some Featured Exhibitors

- Lotus
- DEC
- Intel
- MCI
- Futurus
- Ventana
- NCR
- Borland

☐ YES, I am interested in *ATTENDING*

☐ Full Conference ($795 pre-registered)
☐ Tutorials with full conference ($195)
☐ Tutorials only ($295)
☐ Exhibits only ($25, FREE pre-registered)
☐ Group Discount (please call)

☐ YES, I am interested in *EXHIBITING*

DETACH & MAIL OR FAX TO 602/661-0449

For more information or to register by telephone call 1-800-247-0262 (U.S. only) or 602/661-1260 for international callers

The Conference Group
9875 N. 111th Place Scottsdale, AZ 85259

Name ______________________________
Title ______________________________
Company/Organization ______________________________
Address ______________________________
City/State/Zip/Country ______________________________
Telephone ______________________________
Facsimile ______________________________

GROUPWARE '92

TRENDLINES

PHONE FUTURES

LA BELL EPOQUE

Regulatory and competitive pressures on the nation's telephone companies are transforming our single, universal telephone service into a two-tiered telephone network—an advanced digital network featuring a variety of non-voice services for high-end residential users and businesses, and plain vanilla dial-up for the masses, according to a report by the Insight Research Corp. of Livingston, N.J.

Increased competition in the local telephone-services market, together with price-capping induced by federal and state regulators, is accelerating the rate at which telephone companies adopt new central-office technology while forcing them to cut costs. With these free-market forces spinning the telcos around, it's the end users—corporate, small-business and residential subscribers—who are gaining new, powerful influence over the kinds of services being offered.

Conversion of electromechanical switches to digital technology is already either nearly complete or underway, depending on the type of switch. The pace of value-added service installations is also on the increase. Installations of custom-calling, voice mail and other services offered over switched access lines will grow more than 20 percent during the next five years, thanks mainly to high user demand, the report indicated. While the implementation of Integrated Services Digital Network (ISDN) continues to crawl, broadband trials are underway at nearly every telco.

The need to cut costs is the other major force driving central-office switch modernization and adoption of new technologies. Because of market pricing pressures and slow revenue-sources growth, management's only recourse to maintain profits is to cut operating costs. Toward this end, the telcos have embraced bus-connected distributed architectures and accelerated their switch fabric. Next they will tackle the task of automating operations with new software.

The fallout from these central-office trends will likely scrape away at the market dominance of AT&T and Northern Telecom, according to Insight Research. Foreign switch vendors, particularly Siemens Stromberg-Carlson and Ericsson, are making inroads into the market, capturing some important Regional Bell Operating Co. orders. The study forecasts that the installed base of non-AT&T and Northern Telecom digital central-office switches will grow 19 percent by 1996. ▬

I'LL TAKE VIRUSES FOR $20

If the mug of Asset Management Co.'s John Shoch doesn't show up soon on a box of Wheaties, it's only because General Mills isn't on the ball. Shoch is captain of the West Coast team that wrested the title "Computer Masters of the Universe" from its East Coast rival in the Fourth Annual Computer Bowl, held recently in Boston.

East and West are tied at two wins each in this contest of computer knowledge and trivia. Next year's tie-breaker will be the final contest before the Championship Computer Bowl in 1994.

The contest, which is produced by Boston's Computer Museum and presented by the Association for Computing Machinery, is similar in format to a TV game show. A fund-raiser for the Museum's education programs, the Bowl has raised $2.2 million in cash, products and services since 1988.

For the IT armchair quarterbacks among our readers, we include a sampling of questions from this year's Bowl.

1. IBM once sold a computer known as the Model 5150. By what name is it more commonly known?

2. At the 1979 West Coast Computer Faire, the first Apple clone appeared. What was it called?

3. Apple Computer once asked owners of the Apple III to do something to insure that the integrated circuits inside the computer were securely in their sockets. What were they supposed to do?

(Please see answers below.) ▬

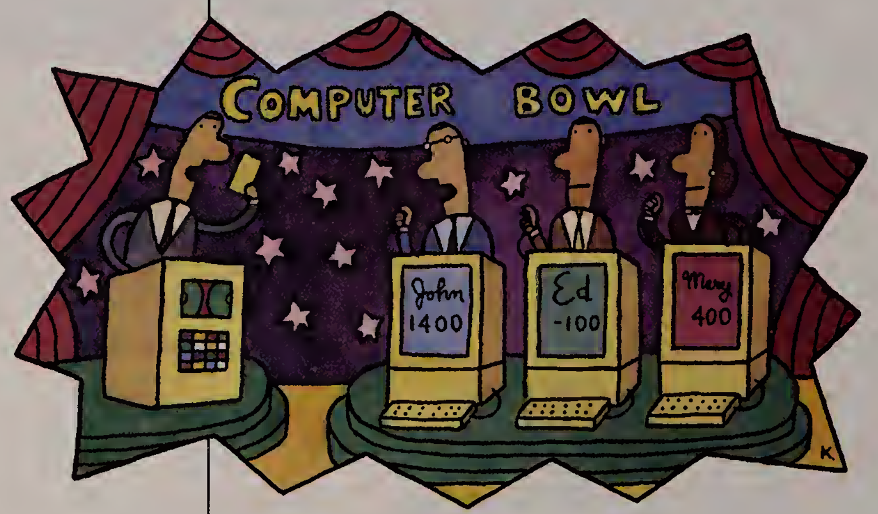


ILLUSTRATION BY JAMES KACZMAN

ANSWERS:
1. The IBM PC, introduced in 1981. 2. The Orange
3. Drop the computer from a height of one foot onto a flat surface.

KUDOS

The Association for Computer Operations Management has named Tsun Shin Chow its 1992 Data Center Manager of the Year. Chow, a department head at AT&T Bell Laboratories' Indian Hill Computer Center in Naperville, Ill., was chosen from among 50 nominees. In keeping with these cost-conscious times, Chow's managerial miracle included, among other things, reducing his data center's budget by 10 percent while maintaining excellent service levels and undertaking a number of new customer-service initiatives. Chow supports the IT needs of more than 5,000 R&D personnel in three locations.

Runners up were Robert W. Jones, computer operations manager for Nike Inc.; Gordon J. Murrell, manager of operations and customer support for Texas Instruments Inc.; Morris V. Polston, manager of computer operations for Miles Inc.; and Philip J. Weis, manager of data computer services for Dana Corp. ▬

Speed without risk

BMC Software's utilities for DB2®

Real speed for real data

More DB2 production environments choose BMC's utilities over those from any other third-party vendor. The reason is speed without risk. BMC's utilities are the fastest available for DB2. And at BMC, we achieve high speed without placing your corporate data in danger.

BMC's utilities are designed to meet both your short- and long-term needs. They provide the speed and integrity you need for whatever size and type of data you have today and plan to have in the future.

Selecting the best

Not all utilities are created equal. Make sure you evaluate the following:

- Elapsed time — You need to handle more data in less time. Can you afford a vendor that won't meet your batch window requirements?
- Ensured integrity — Some products have integrity gaps. Can you afford the exposure?
- Longevity — Not all products can efficiently handle large objects. Can you afford a product that you will outgrow in 24 to 36 months?
- Flexibility — Not all products support all DB2 object types and multi-volume data sets. Can you afford to let a third-party vendor impose limitations on your design?

There's only one sure way to measure the effectiveness of any utility — trial it on your own data. For a no-obligation 30-Day-Plus Free Trial, or for more information on our utilities for DB2, call BMC Software at 713 240-8800 or **1 800 841-2031**.

BMC
SOFTWARE

The Experience. The Technology. The Future.

BMC Software international offices are located in Australia, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain and the United Kingdom.
DB2 is a registered trademark of IBM Corp. © 1992, BMC Software, Inc. All rights reserved.

IBM
Business Partner

TRENDLINES

ELECTRONIC ART

A SHOWING OF NEW MASTERS

It may not be as celebrated as the Armory Show, but what that exhibition did for the Modernists 80 years ago, Corel Systems' design contest is doing for computer artists in the '90s.

The third annual CorelDRAW World Design Contest, held recently in Ottawa, attracted 3,371 entries from North America, Southeast Asia and Europe. That's triple the number of entries received last year—due, in part, to the growth of the IBM-compatible segment of the illustration market.

This year's best-of-show award went to British Columbian artist Bill Frymire for his piece "REX." Frymire's work will now be featured in an international advertising campaign, whose promotional value Corel estimates at $500,000. He also received a one-kilogram solid-gold bar. "'Rex' symbolizes the renaissance of the modern art community," said Corel President Michael Cowpland.

First-place winners were also selected in nine categories, including technical drawing; people, plants and animals; landmarks; logos and business; and transportation. Each winner received a $15,000 personal computing package. ■

Big Fish...
Small Pond.

"Rex," (left) by Canadian computer artist Bill Frymire, received the best-of-show award at the third annual CorelDRAW World Design Contest. Gary Priester of California took first prize in the desktop-publishing category for "Bigfish" (above.)

CAREER MOVES

HERBERT H. ZUEGEL retired on June 23 as Director of MIS for Wm. Wrigley Jr. Co. in Chicago. Zuegel, who was with Wrigley for six years, has spent the past 25 years working in the information systems profession. Following a summer of rest and relaxation, Zuegel plans to do some freelance teaching and consulting.

F. ROBERT KURIMSKY, former vice president of corporate information systems at Philip Morris Companies Inc., has signed an exclusive consulting agreement with Technology Solutions Co. (TSC), headquartered in Chicago. Kurimsky, who headed IS for Philip Morris USA before taking over the reins at corporate, will "provide TSC with expertise and insight into the management and technology issues facing today's largest consumer products companies," according to the consultancy, which also has offices in New York, Dallas and California. ■

GIVE ME YOUR TIRED, YOUR POOR, YOUR SURPLUS COMPUTERS

A computer is a terrible thing to waste. But fortunately for journalism students in Moscow, business students in Bulgaria and physicians in Poland, a two-year-old organization is combating waste by transferring surplus or outmoded computers from the technology-rich to the technology-poor.

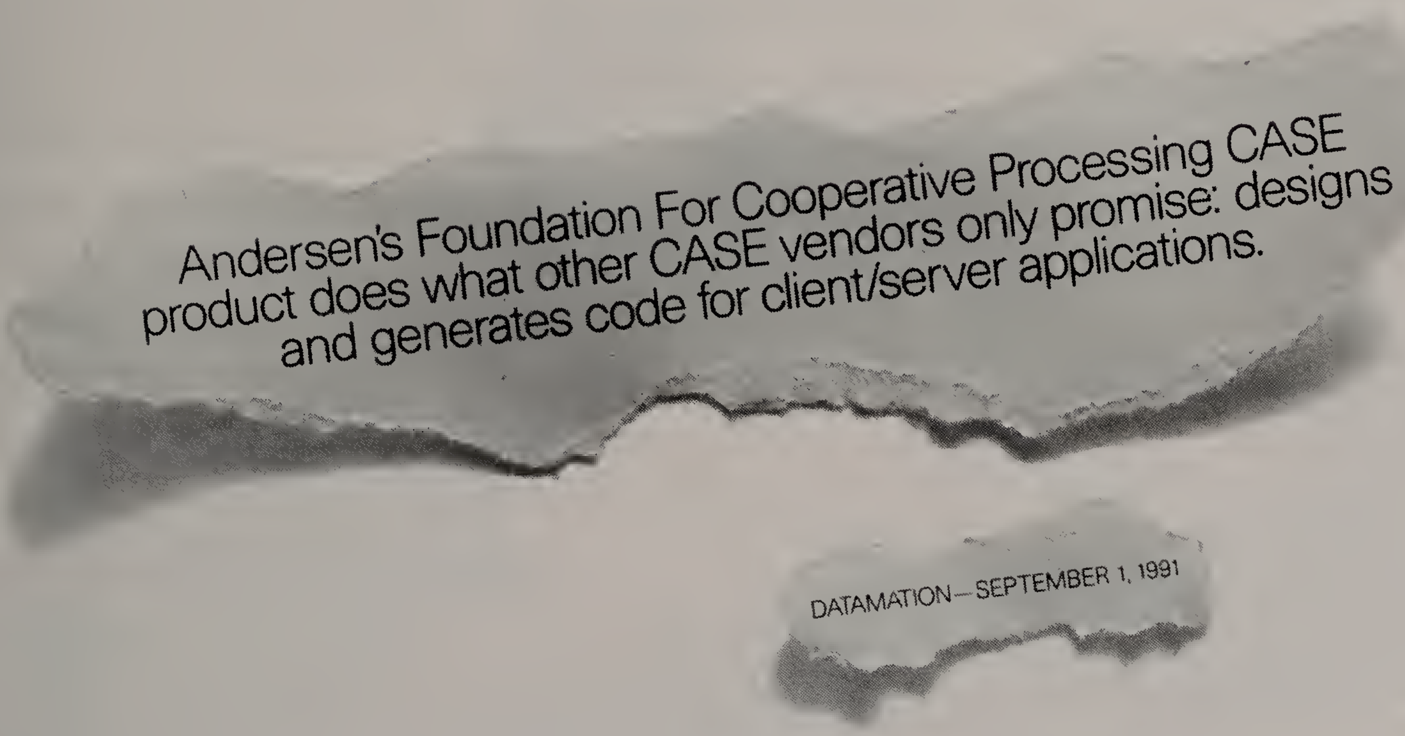
The University of Moscow, Sofia University in Bulgaria and a hospital in Lodz, Poland, have recently received computers from the East West Education Development Foundation, a not-for-profit organization dedicated to furthering democracy and entrepreneurship in post-communist countries. Founded by Patrick McGovern, founder and chairman of IDG (*CIO*'s parent company), East West solicits donations of new and used computer equipment for education centers, research institutes and not-for-profit organizations that promote freedom of speech, science and entrepreneurship.

The computers are placed with trainers who deliver them to a site, train the users and then leave the equipment. Tools that are obsolete in America are immeasurably valuable to people in countries where the free exchange of information has long been suppressed. The IBM PC AT is particularly useful because it is both readily available as surplus equipment and almost infinitely adaptable to different environments.

Founded in 1990, East West recently received a $220,000 Computers for Democracy grant from Washington's National Endowment for Democracy. For information on donating used or surplus computing equipment to the Foundation, call 617 542-1234. ■

PHOTOS COURTESY OF COREL SYSTEMS CORPORATION

©1992 Andersen Consulting. All rights reserved. FOUNDATION® is a registered trademark of Andersen Consulting.



Andersen's Foundation For Cooperative Processing CASE product does what other CASE vendors only promise: designs and generates code for client/server applications.

DATAMATION—SEPTEMBER 1, 1991

Considering how much has been written about CASE tools for cooperative processing, we thought you would appreciate an executive summary.

ANDERSEN
CONSULTING
Software Products

For the full story on FOUNDATION for Cooperative Processing including case histories, call 1-800-458-8851. Outside the U.S. or Canada, 1-312-507-5161.

Now there's a comp
as fertile as the mi

Lotus® Notes® is more than a technology story. It's a breakthrough solution that solves real business problems by helping you harvest the collective expertise within your organization. Not to mention making better use of your existing hardware, software and network investments.

Look at the challenges on the business horizon. There's the perennial need to be more competitive. To grow the business. To get closer to your customers and suppliers. There's also the need to do more with less. And to enhance the quality of the products or services you deliver to your customers. Notes is the tool that helps you accomplish all this with relative ease.

What's more, if you're an IT or MIS professional, you're concerned with finding a better way to leverage the technological resources already in place within your organization. Without incurring major expenditures of time and money.

With Notes, you can deliver customized and flexible applications to workgroups in less time. And for less money. That's because Notes gives you an open,application development environment to work in. Where the widest variety of

Lotus Notes is an innovative, workgroup computing enviro

©1992 Lotus Development Corporation. All rights reserved. Lotus, Lotus Notes and 1-2-3 are registered trademarks of Lotus Development Corporation. Novell is a registered trademark
DEC is a registered trademark of Digital Equipment Corporation. Banyan is a registered trademark of Banyan Systems, In

uting environment
nds that work in it.

applications that facilitate information sharing can be quickly developed and deployed to multiple users at multiple sites. Regardless of what networks, applications and operating systems are in place.

With Notes, both IT professionals and end users can work together to create applications that solve very specific problems.

In fact, right now there are small and large companies using Notes for sales lead tracking, product planning, brainstorming, account management, project tracking, call reporting, quality management and a whole lot more.

"With Notes we now have a quicker, more efficient way of delivering some incredibly useful applications to our people. For example, we created a customer information and profile application that was up and running in less than two months. Now that's fast.

Further down the road, we're envisioning a model that serves as a virtual town meeting for everyone in the organization. Where no matter what any one of us is trying to accomplish at any point in time, we'll have all the resources of the rest of the organization behind us and available to us. Which means as IT professionals, we will be in a much better position to help our company realize its business goals. And to bring a better level of service to our customers."

Bob Kantor
Ciba-Geigy Corporation

Lotus Notes lets you bring different areas of expertise together within your organization more naturally.

All of which makes Lotus Notes much more than a single application. It's an environment that's extremely flexible. Plus, it runs on the most popular networks such as Novell,® IBM,® Microsoft® DEC® and Banyan.® And in Windows® and OS/2.®

Of course, just as we've done with 1-2-3,® we're committed to having Notes run on all major platforms, including Macintosh® and UNIX.® Plus there are many third parties offering a range of products and services that further extend the value of Notes.

What's more, when you look at all Notes can do—and how quickly it can do it—it's not very expensive at all. In fact, you can get started with Notes for about $500 per user.

So call us today at **1-800-872-3387, ext. 6696.** And see how Lotus Notes is cultivating a better environment in which people can truly work together.

Lotus Notes

For the Notes Seminar nearest you,
call 1-800-828-0541.

ment designed to increase your organization's productivity.

vell, Inc. IBM and OS/2 are registered trademarks of International Business Machines Corporation. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation.
cintosh is a registered trademark of Apple Computer, Inc. UNIX is a registered trademark of UNIX System Laboratories, Inc.

TRENDLINES

How to Succeed In Business

If you've got your eye on the corner office, you might consider spending some time among the ranks of sales and accounting. A recent Robert Half International survey shows that the Willy Lomans and bean counters of corporate America may have an edge when it comes to landing the CEO job.

Two hundred Fortune 1,000 executives were asked to identify the most suitable background for a CEO. Topping the list: sales and marketing, cited by 29 percent of respondents, followed by accounting and finance (27 percent) and operations (22 percent).

In a related survey, 72 percent of respondents felt that top management would become increasingly reliant on information provided by the accounting department. According to Robert Half Chairman Max Messmer, tough economic times and the financial mismanagement of the '80s are responsible for adding luster to accounting.

How ironic that despite all the lip service paid to quality and strategic planning, it looks like the short-sighted may inherit the earth. ■

CALL FOR SUBMISSIONS

ROI is on everyone's mind. Our January 1993 issue will feature companies that have been able to align IT with corporate goals and demonstrate its bottom-line payoff. We invite our readers to send in their own success stories. Guidelines for submissions are on Pages 23 and 24.

HEALTH-CARE SPENDING

An IT Shot in the Arm

When the going gets tough, sometimes the tough really do go shopping. So say the results of a survey revealing that health-care organizations are increasing IT spending in response to the weak economy.

Hewlett-Packard and the Healthcare Information and Management Systems Society (HIMSS) polled 548 health-care professionals at the 1992 Annual HIMSS Conference. Nearly 40 percent of respondents said they have increased IT investments during the recession in an effort to increase productivity. Plans to reduce IS budgets next year were reported by 22 percent, with another 15 percent stating that they have already curtailed IS spending, and only 8 percent saying that they have cut staff as a result of the recession.

"Clearly, hospitals are looking for a real financial payoff from computer investments," said Dennis L'Heureux, HIMSS president and vice president of IS at MetroWest Medical Center in Framingham, Mass. "The recession may be triggering purchases even as the industry as a whole tries to document the true efficiencies that information systems have already made possible."

According to L'Heureux, another indication that hospitals are becoming increasingly reliant on IS is the high degree of sensitivity among CFOs toward technology. CFOs were rated very responsive to the potential benefits of IT by 28 percent of respondents, outranking CEOs, COOs and medical-staff members.

Respondents said that the bulk of IS investments over the next two years will be made in patient-care/bedside systems (43 percent), followed by medical records (22 percent) and outpatient/physician offices (18 percent). Attitudes toward the role of IT are currently somewhat conservative: 42 percent of respondents said they are seeking improved efficiency by automating tasks with standard technology, while 34 percent hope to enhance their competitive advantage with leading-edge technology.

Topping the list of innovative technologies respondents most wanted to adopt were optical scanning, executive information systems, portable computers, picture-archiving communications systems, voice recognition and expert systems.

This year's biggest non-issue appears to be outsourcing. Forty percent are not even considering it, and another 15 percent have ruled it out as an option. ■

The (Printer's) Devil's Dictionary

Don't know your ADF from your ADP? Did you think that a hairline rule had something to do with your firm's policy on coiffures, or that a dropout halftone was a '50s bebopper who never finished high school? Does the term "deadly embrace" make you think only of Glenn Close?

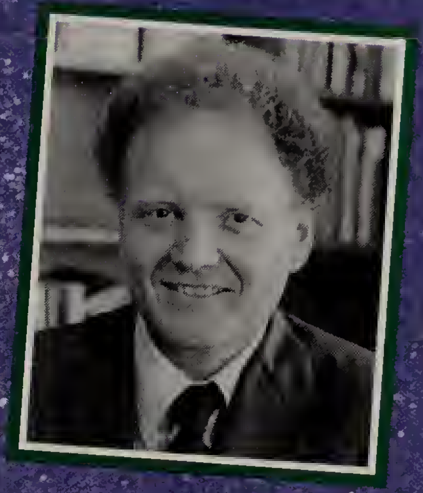
These and other similarly arcane terms are explained in Xplor International's "Glossary for the Electronic Document Systems Industry." This 113-page booklet includes "terms, concepts and products that relate in any way to this industry." Many of the entries were born in the typesetter's shop (a hairline rule is a very thin line; a dropout halftone refers to gray scale). The glossary lists vendor-specific terms and acronyms as well as the expected terms of art (digital loopback, Fortran, PROM). It even includes what the authors describe as "endearing" terms: Hardheads are "employees who are extremely knowledgeable with the hardware aspects of their printing systems"; KODIAKs are "employees of Eastman Kodak, especially the ones who come from the cold northern territory of Rochester, N.Y."; a pel whacker is "a person who creates fonts for a living" (a pel is "an element of a raster pattern," if that helps).

The glossary is provided free to members of Xplor International, an association for the electronic-document systems industry. Nonmembers can purchase copies for $25 by calling 310 373-3633. ■

ILLUSTRATION BY JAMES KACZMAN

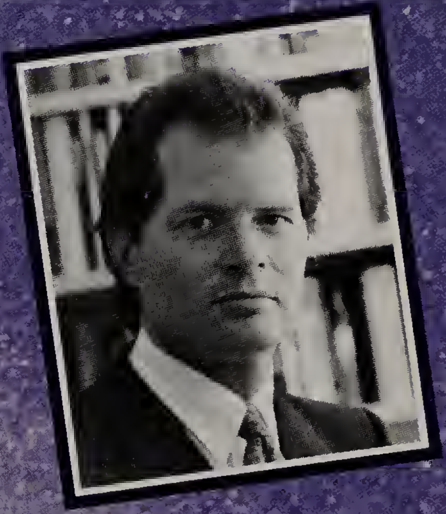
CIO
THE MAGAZINE FOR INFORMATION EXECUTIVES

CONFERENCE SUPPLEMENT
to CIO MAGAZINE
BOCA RATON RESORT & CLUB
BOCA RATON, FLORIDA
OCTOBER 11-14, 1992



CIO PERSPECTIVES SERIES

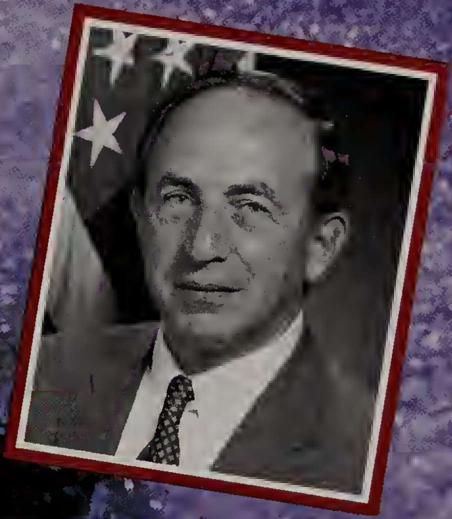
The Process of IT: Organizing for Success



Head to Head

The Machiavellian CIO

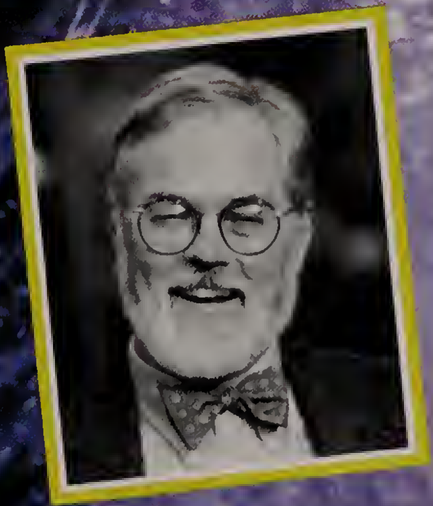
Seizing the
Customer Moment



Outsourcing and the
Corporate Mission

Winning through
Reengineering

Prime Time
Client/Server Computing



Waves of Change

Defense and IT

Never Mind What You Know...

©1992

CIO

CONFERENCE SUPPLEMENT

Conference Overview
Joe Levy and
Lynda Rosenthal

Waves of Change

Agenda
Session topics, presenters and
scheduled activities are outlined.

Companion Program
Bring your companion!
He or she will join you in conference
receptions and meals while
participating in a separate program.

Boca Raton Resort & Club
A five-star property in a grand location.

Conference Hosts
Select industry product and service
providers will be on hand.

Enrollment Form

Don't wait!

Cover photo: Guy Motil / West Light

Conference Overview

Ask a dozen people what "process" means and you'll get a baker's dozen answers. Process transcends management and technology; yet it is the essence of both. As we continue to examine each and every element in the overhaul of our business systems and practices, we must simultaneously uncover the keys to enrichment and satisfaction for ourselves and our coworkers.

The next CIO Perspectives conference, The Process of IT: Organizing for Success, will bring together authorities and practitioners from multiple disciplines. Moderated by Jim Wetherbe, director of MIS research and professor of MIS at the University of Minnesota's Carlson School of Management, the conference will target the three issues that successful information technology management must address: infrastructure, enabling technologies and management and control.

Lester Thurow will establish the context; Doug Nagan will talk politics; Tom Harbison, Chris Bluemer and Kathleen Taylor will tell war stories. Paul Strassmann will describe the challenge of reducing the Defense budget while satisfying increasing information demands; panelists will discuss IT as the business process change enabler and pioneering new operating models. And Robert Fulghum will—well—delight us.

As in the past, there will be a variety of formal and informal gatherings where participants can discuss these and other issues, all in the setting of Florida's five-star, 223-acre Boca Raton Resort & Club, located midway between Palm Beach and Fort Lauderdale.

We stopped taking enrollments weeks before our last conference. To avoid being left out in the "old," complete the enrollment form on the back cover of this program and fax it to us at 508/872-0618. To enroll immediately, call us at 800/366-0246.

Regards,

Joseph L. Levy
Joseph L. Levy
President & Publisher

Lynda Rosenthal
Lynda Rosenthal
Vice President & General Manager
Executive Programs

Deann J. Shier

Deann J. Shier

Deann J. Shier

Ron Chapoele/FPG

Creating a new paradigm requires that CIOs move to the next level above their departmental goals. They must commit to being businesspeople first by working directly from the corporate business plan.

Waves of Change

Dick Luria/FPG

By Meghan O'Leary

The challenges of doing business in increasingly competitive, fast-moving and global markets are enough to test the skills of even the most business-savvy CIO. These challenges range from reengineering business processes to ruggedizing technical infrastructures. Companies intent on shaping the marketplace rather than merely reacting to it must prepare by marshalling and reevaluating their technical and human resources, with an eye toward long-term business goals.

From a management perspective, the buzzwords abound: reengineering, downsizing, outsourcing. They sound simple and effective, but creating a new corporate paradigm requires that CIOs move to the next level above their departmental goals. They must commit to being businesspeople first by working directly from the corporate business plan.

Nowhere is this mandate more imperative than in reengineering, according to Kathleen M. Taylor, vice president of CIGNA Systems division, which provides IS services for the CIGNA Companies. In 1989 Taylor began a systems-redesign project to determine why the company was getting only incremental improvements from technology. That project turned into a business-strategy reengineering project for an entire division and resulted in a dramatic 60 percent improvement in throughput and a 40 percent reduction in costs. Strategic reengineering allowed the division to eliminate some processes as well as some systems-development efforts that "didn't lend themselves to [the business] strategy. Reengineering, if it's done correctly, forces you into that kind of [activity]," Taylor explained.

Large businesses or divisions with more complex strategic plans and supporting processes may benefit from a combination of strategic and process reengineering, making small changes in support of the larger strategic overhaul. Experienced CIOs also recommend this approach for modernizing the business's entrenched technological base.

They agree that the key to migrating successfully to flexible, open systems is to focus on adding and coexisting, rather than razing and rebuilding. The PC and its attendant group of programming tools make this possible, according to Taylor, by allowing CIOs to build more flexible, responsive, functional networks on top of old-style mainframe systems. Thus they can migrate systems gradually to microcomputer platforms, reshaping the role of the mainframe instead of merely trashing it. You cannot have an effective competitive process that supports the business plan "if you've got to rewrite a whole backbone system," she said. "You've got to retool it."

Lou Jones/Image Bank

"Change is the issue because it alters the power bases and comfort zones of people." Effective CIOs keep people uncomfortable because they are constantly initiating change. —Doug Nagan

Companies that want to enter new markets face a different set of problems in getting up to speed on the business plan. As president and CEO of Fireman's Fund of New Jersey (a subsidiary of Fireman's Fund Insurance Company) Chris Bluemer relied on outsourcing to help him start a separate auto insurance company and pick up 20,000 policyholders in a matter of six months. The parent company had been planning to drop its auto insurance activities; then New Jersey's government decided to get out of the business and required all private auto insurance carriers in the state to pick up the abandoned policies. Bluemer's mission was to meet state requirements, consolidate FFNJ's current auto insurance activities, and build a separate, successful, $75 million business that the company could sell off easily in two years.

"The worst thing to do [under those circumstances]," Bluemer said, "is to start incorporating the parent-company systems, the parent-company payroll and bureaucracy," no matter how open and advanced. "We basically have outsourced almost every service here—medical benefits, policy issue, customer information systems. It's better to rent a company than to start your own."

Ed Taylor Studio/FPG

A Business-Savvy IS Staff

Bluemer's decision to outsource allowed him to further support the business plan by putting his money into hiring exceptional business staff rather than programmers. While most companies desire, and some already have CIOs with business skills, IS staffs with business skills are less common.

Since programmers are not generally promoted because of their business and political expertise, business-savvy technical staffers are more likely to be made than found, according to Doug Nagan, senior vice president and CIO for publisher John Wiley and Sons, Inc., in New York. Many CIOs are forming partnerships between their staffs and those of the divisions they support in order to facilitate this transformation.

Paradigm shifters should look outside their own fields for ideas. They should ask, "What is currently impossible to do in my field but, if possible, would fundamentally change it?"

One potential ready-made labor pool, according to both Taylor and Nagan, is the white-collar professional workforce. PCs, client/server computing and PC-based development tools have created a new breed of businessperson, well-grounded in technology and at least somewhat familiar with systems design. Many of these workers already use various PC programming tools to create reports and applications. Taylor believes that the time is ripe to hire these people as IS staff.

Although they are not ready to take users on as staff, executives like Fred Winograd, Merrill Lynch's head of technology planning, see another means of tapping into that pool. They are giving users more tools that allow them to meet their own programming needs, thus taking some of the pressure off the IS group. Winograd compares his solution to long-distance direct dialing—AT&T's smart substitute to hiring millions of operators.

Until they can harness the growing technical strength of users, CIOs would be well advised to keep a close eye on them, according to consultant Portia Isaacson, president of Dream IT in Cambridge, Mass. These professionals are experiencing new power and independence, enabled by better tools and smaller, more mobile desktop technologies such as laptops and palm computers. CIOs must find new ways to partner with and manage this emerging group of power users, while planning for the shifts such mobilizing technologies will necessitate in managing the network.

A picture of the future of corporate IS is readily available; yet change is slow in coming. Why? Because people don't like change, says Wiley's Nagan. Nagan is fond of quoting the 16th century political philosopher Niccolo Machiavelli: "It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system, for the initiator has the enmity of all who would profit by the preservation of the old institutions and merely lukewarm defenders in those who would profit by the new ones."

Art Montes de Oca/FPG

"Change is the issue," Nagan said, "because it alters the power bases and comfort zones of people." He believes that effective CIOs keep people uncomfortable because they are constantly initiating change.

The best remedy for a molasses-like corporate culture, he advises, is to go back to that business plan, this time via the CEO. "The only way you can be successful is to find a way to understand what the CEO wants. If you're fortunate you find that the business-unit strategies are really in support of what he wants... and everybody views what you are doing as supporting them. This requires teamwork, the art of political compromise, the art of the possible." ■

CHANGING PARADIGMS

Joel Barker, a self-proclaimed "process futurist" and founder of Infinity Ltd, Inc., in Minneapolis, is the father of the overused but under-comprehended phrase "paradigm shift." The author of a book on the subject (*Future Edge*), Barker has spelled out four rules that govern the process:

RULE ONE: The next paradigm shift in your business is likely to show up well before you're ready for it. This is exemplified by the early Apple and Radio Shack PCs that sold only to electronics hobbyists.

RULE TWO: Paradigm shifts tend to be introduced by people who don't know your business. The publishing industry didn't invent the personal data disc player—the likely format for magazines of the future—Sony did.

RULE THREE: The people who change paradigms do so with more courage and intuition than market data.

RULE FOUR: Making the shift means changing the rules. For example, the Japanese have historically changed paradigms by perfecting a number of American inventions.

Barker advises potential paradigm shifters to look outside their own fields for ideas. They should ask, "What is currently impossible to do in my field but, if possible, would fundamentally change it?" and also anticipate the positive and negative implications of a shift. Anticipating paradigm shifts can put a business two to three years ahead of its competitors. The problem is that "we have people who declare themselves as leaders who don't understand that the basic rule of leadership is risk," Barker said. "Leaders are people you follow where you won't go alone."

Agenda

CIO PERSPECTIVES SERIES

Lester Thurow

DuWayne Peterson

Jim Wetherbe

SUNDAY, OCTOBER 11

2:00PM–6:00PM	Conference Registration
7:00PM–9:00PM	Networking Reception

MONDAY, OCTOBER 12

7:00AM–8:00AM	**Continental Breakfast**
8:00AM–8:30AM	**Welcome & Opening Remarks** Joseph L. Levy, *President & Publisher CIO Publishing Inc.* Conference Moderator: Jim Wetherbe *Director, MIS Research Center & Professor of MIS Carlson School of Management University of Minnesota*
8:30AM—9:55AM	**Head to Head: The Coming Economic Battles among Japan, Europe & America** Lester Thurow *Dean, MIT Sloan School of Management Economist & Author*

In the next half century, the world economy will be a competitive-cooperative game where the clear distinctions between teammate and opponent will have vanished. The game will be played with new rules and involve new participants who approach capitalism in communitarian ways quite different from the individualistic practices of the Anglo-Saxons. At the same time, a series of technological revolutions are fundamentally changing the relative importance of natural resources, capital, technology and skills in sustaining economic prosperity.

9:55AM–10:25AM	**Coffee Break**
10:25AM–11:55AM	**Turning On the Power Station: Pioneering the New Operating Model** Panel Moderator: DuWayne Peterson *Chairman, DuWayne Peterson Associates*

The current "service station" operating model for IT delivery is dead. A "power station," fueled and owned by the entire management team, is the model for managing IS in the '90s. But how do we get there? The challenge is to take research and insight into the new operating model, affirm it and make it happen in the real world. What are the steps required? What are the obstacles and how can we overcome them? Is anyone operating a power station yet? What should we salvage from our old way of managing IS? An Implementation Task Force of prominent CIOs, facilitated by Booz Allen & Hamilton and chaired by DuWayne Peterson, former CIO of Merrill Lynch, will tackle these issues.

12:00PM–1:30PM	**Luncheon**
1:30PM–4:30PM	**Networking & Affinity Groups** Various small group, facilitator-led discussions and recreation

THE PROCESS OF IT: ORGANIZING FOR SUCCESS

October 11-14, 1992, Boca Raton Resort & Club, Boca Raton, Florida

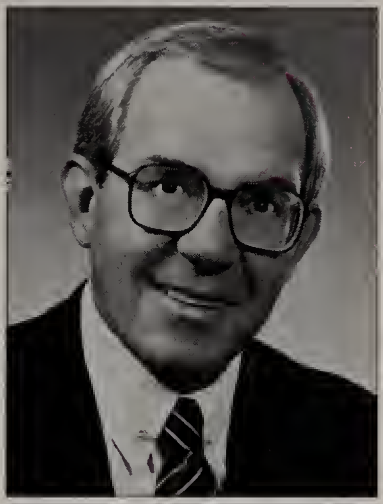
MONDAY, OCTOBER 12 (CONTINUED)

Affinity Groups
(Additional Affinity Groups will be available at the conference)

Creativity in Business: A Formula for Success

Jim Young, *Assistant to the Chairman*
EDS

The founder and honorary chairman of Sony, Masaru Ibuka, recently was quoted as saying, "The key to success for Sony, and to everything in business, science and technology, for that matter, is never to follow the others." By applying creativity tools and techniques, we can become leaders of our industries and in our companies. This session will explore some of these tools and their applications.



Jim Young

Developing a Corporate IT Architecture

Dr. Lonnie Spund
Chief Information Systems Architect
Apple Computer

6:30PM–7:30PM **Reception**

7:30PM–10:00PM **Dinner on the Beach**

TUESDAY, OCTOBER 13

7:00AM–8:00AM **Continental Breakfast**

8:00AM–8:50AM **The Politics of IT: The Machiavellian CIO**

Doug Nagan, *Senior Vice President & CIO*
John Wiley & Sons

Technology and business processes occur within a complex set of relationships, environments and priorities, with many conflicting objectives. At the same time, our enterprises are political systems consisting of individual constituencies with specific requirements, beliefs and objectives. Like politicians seeking office, we need to gain the endorsement and support of these various constituencies. Managing change is key, because change alters power structures and intrudes upon people's comfort zones. What do CIOs as change-makers need to do to understand the inherent difficulties in making people embrace change, and how can we facilitate the process? We will examine the role of the hero, the art of the possible, and developing our own constituency.

Doug Nagan

8:50AM–9:40AM **The Value of Process Redesign: Seizing the Customer Moment**

Tom Harbison, *Chairman & CEO*
Neodata

Too often, IT simply reacts to specific situations without improving underlying processes. Neodata—the nation's largest fulfillment house, providing magazine subscription and book fulfillment, telemedia services and other direct-marketing services—accounts for two percent of the nation's annual postal volume. Despite its size, Neodata seeks to optimize each and every customer contact—no small task for an organization with more than 130 million customers. Chairman and CEO Tom Harbison will relate how Neodata used IT to fundamentally redesign its approach to customer service.

Tom Harbison

TUESDAY, OCTOBER 13 (CONTINUED)

9:40AM–10:10AM **Coffee Break**

10:10AM–11:00AM **Is Client/Server Computing Ready for Prime Time?**

Fred Winograd, *Vice President*
Distributed Applications Planning
Merrill Lynch Inc.

Client/server technology must be sufficiently advanced before most companies will be willing to forgo their existing commitments to mainframe platforms and build for the future with a distributed-processing environment based on client/server architected LANs. The issues that will determine client/server's readiness for prime time include being able to control data security and provide end users with the graphical user interfaces they demand without risking "data anarchy" at the workstation level; the availability of secure, fast, sufficiently robust relational databases; and LAN administration and speed.

Chris Bluemer

11:00AM–11:50AM **Using Outsourcing to Realize the Corporate Mission**

Chris Bluemer, *President & CEO*
Fireman's Fund of New Jersey

Providing automobile insurance in New Jersey requires the ability to respond quickly to anticipated surges in business activity, and that requires effective information technology. But building internal systems takes time—something the Fireman's Fund of New Jersey didn't have. "Renting" the technology and systems is one way in which outsourcing can be used to solve some of the speed-to-market barriers.

12:00PM–1:10PM **Luncheon**

Kathleen Taylor

1:10PM–2:00PM **Winning through Reengineering: A Strategic, Not Systems, Concept**

Kathleen Taylor, *Vice President*
CIGNA Systems
CIGNA Companies

The business motivators that drive reengineering require corporate-wide planning, and acknowledgement that reengineering is not solely a systems concept. CIGNA has successfully reengineered 13 business divisions. Vice president of CIGNA Systems Kathleen Taylor will discuss the lessons learned and the critical success factors that ensured that success and enabled CIGNA to remain competitive.

2:05PM–3:00PM **Concurrent Sessions**

Reengineering Product Development for the '90s

Larry Tieman

Larry Tieman, *Chief Technology Officer*
Nielsen Marketing Research

The business climate of the '90s presents enormous challenges for product development. Organizational structure is changing, with flatter organizations, outsourcing, networked enterprises, self-directed teams and dispersed organizations all part of the new mix. New technical issues—object-oriented development, knowledge-based systems, client/server architectures, downsizing—are emerging. Underlying all these changes are an increasingly diverse workforce and the challenges of providing advancement for technical-track personnel. A successful product-development organization must reengineer to meet these challenges head-on.

THE PROCESS OF IT: ORGANIZING FOR SUCCESS

October 11-14, 1992, Boca Raton Resort & Club, Boca Raton, Florida

TUESDAY, OCTOBER 13 (CONTINUED)

2:05PM–3:00PM **Not Just Another Quality Story**

Tom Repede, *Director of Corporate Quality*
Computer Associates

You've probably heard about Total Quality Management. If your organization hasn't already started a major quality initiative, chances are good that it will soon. You may hope to one day win the coveted Malcolm Baldrige National Quality Award, or you may just use its criteria as guideposts. But is TQM a passing craze? Can it succeed in your organization? In what ways will IS be called upon to assist other departments in the enterprise, and what does it mean for IS to practice TQM? This session will provide direct answers and practical advice. You'll learn how the seven criteria of the Baldrige award can be applied to IS, and you will see how IS can support the rest of the organization in practicing TQM.

IT: the Driving Force of Business Process Redesign

Dr. Keith Short, *Director of IEF Research*
Laboratory & Research Director
JMA Information Engineering Ltd.
Texas Instruments

There is a good fit between the basic business modeling concepts of Business Process Engineering (BPE) and Information Engineering (IE). IE, on the one hand, requires greater detail consistent with the objective of producing information systems, whereas BPE embodies additional, higher levels of abstraction consistent with the objective of optimizing business performance. Dr. Short will address the relationship between information technology and business process redesign.

Implementing Worldwide Workgroup Computing

Gene Cort, *Vice President*
Information Systems & Support
Lotus Development Corporation

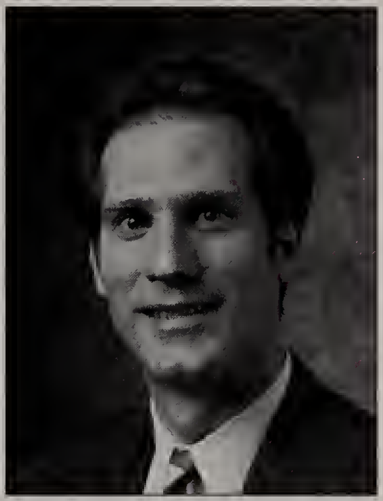
The architecture of the '90s must integrate structured data from mainframe, mini and PC-based transaction systems, store it in "data warehouses," and deliver it to managers' desktops. Lotus's IS department developed a state-of-the-art management information system that gets IS out of the report-writing business and keeps Lotus executives informed.

3:00PM–3:30PM **Coffee Break**

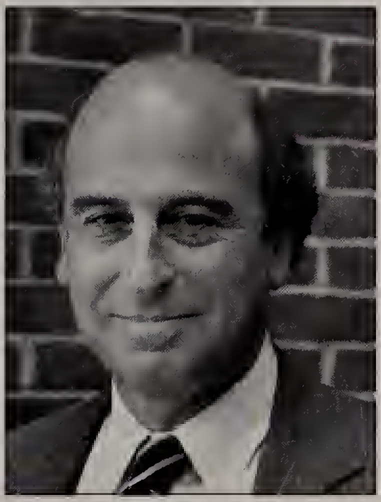
3:30PM–5:30PM **DoD and IT: Declining Budgets, Increased Expectations**

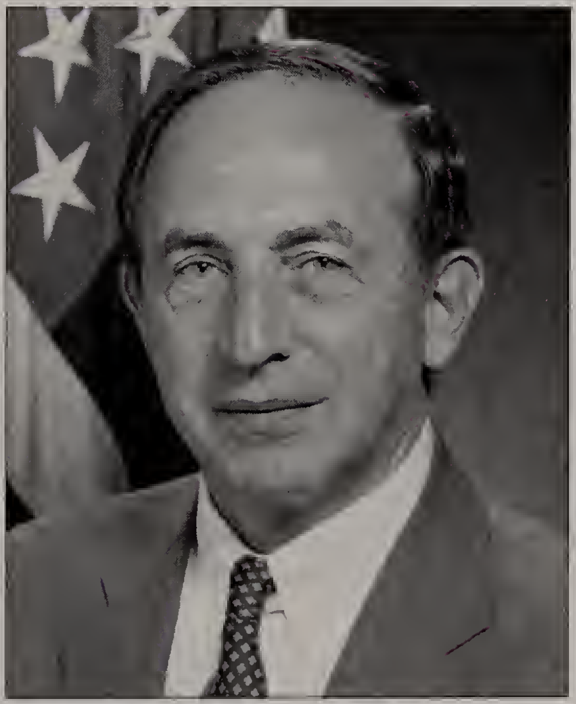
Paul Strassmann, *Principal Deputy Assistant Secretary of Defense for C^3I*
Department of Defense

With an annual IT budget in excess of $20 billion, the Department of Defense is the world's largest information processing organization. Its Corporate Information Management (CIM) program is designed to systematically redesign its information systems while its resources are cut by about one-third. CIM has introduced a financial-management process for assuring enterprisewide integration, a design doctrine based on rapid deployment of information resources in the battlefield, a business-process modeling standard, a commitment to open systems, a software re-use organization, a new technique for justification of IT investments, and an organizational structure that redefines the relationship between operating and technology staffs. Systems integration and interoperability are now an essential core competency at DoD. A discussion of the principles that guide the present restructuring provides a dramatic look at how a giant organization copes with the management of change.


Tom Repede

Dr. Keith Short


Gene Cort


Paul Strassmann

Agenda

CIO PERSPECTIVES SERIES

Marcia Blumenthal

James K. Hull

John W. White

Debi Coleman

Michael C. Fischer

Kavin W. Moody

TUESDAY, OCTOBER 13 (CONTINUED)

5:30PM–6:30PM **Reception with Paul Strassmann**

WEDNESDAY, OCTOBER 14

7:00AM–8:00AM **Continental Breakfast**

8:00AM–8:40AM **IT: The Enabler of Business Process Change**

Moderator: Marcia Blumenthal
Editor-in-Chief, CIO Magazine

Larry Tieman, *Chief Technology Officer*
Nielsen Company

James K. Hull, *Vice President*
Information Systems & Services
NCR Corporation

John W. White, *President*
Information Technology Group
Texas Instruments

Whether the product is manufactured goods or services, today's organization has to be more flexible to become a high performance competitor. Three IT executives will share their strategies for enabling business process change in their organizations.

8:40AM–9:20AM **Building a Dynamic Information System**

Debi Coleman, *Vice President*
Information Systems & Services
Apple Computer

The client/server environment requires a new conceptual framework and architecture to build a modular corporate information system. A comprehensive, vendor-independent planning guide and blueprint for system design is required to create and maintain a resilient infrastructure.

9:20AM–10:15AM **Concurrent Sessions**

Driving Business Performance by Leveraging Resources

Michael C. Fischer
Division Vice President, Consulting
EDS

As companies continue to invest in information technology, they increasingly demand enhanced business performance as a return on their investments. Business Information Planning facilitates the process of determining the business value of IT, identifying business requirements and aligning technology to support and achieve strategic business goals. This organized approach ensures that limited human, technology and capital resources are leveraged and applied according to business priority in ways that contribute most to future business needs.

The Top Ten IS Management Challenges for the '90s

Kavin W. Moody, *Senior Vice President*
Technology Investment Strategies
Corporation

Not long ago, many information executives prospered by simply aligning themselves with a big successful vendor. But with the existence of

THE PROCESS OF IT: ORGANIZING FOR SUCCESS

October 11-14, 1992, Boca Raton Resort & Club, Boca Raton, Florida

WEDNESDAY, OCTOBER 14 (CONTINUED)

proprietary strongholds becoming a thing of the past, and with one out of every three CIOs losing his or her job each year, all that has changed. This session will focus on the top ten IS challenges facing IT executives.

9:20AM–10:15AM **LANs and WANs: The Marriage for the Next Century**

Bob Steinkrauss, *Senior Vice President & General Manager*
LAN Internetworking Division
Racal-Datacom

Harmony between LAN and WAN strategies is essential to corporate success. Yet the issues of cost, control and compatibility can disrupt that harmony. Speed is acknowledged as the most important factor when considering LANs, while cost is the major issue with WANs. Making a successful marriage between these two is the challenge for successful enterprises.

Getting Started: Why Not Reengineer the IS Process Itself?

Ed Jebber, *Assistant Vice President*
Information Systems & Services Group
NCR Corporation

Today's organizations are moving from the collection of data to the management of information. Implementing an open computing environment enables you to leverage your existing investment while providing a pathway for improving data and information handling in the future. These strategies can make your IS organization more effective by capping mainframe development and using new technology to reduce the programming backlog, thus making information systems more responsive and your organization more effective.

Pushing A Rope Uphill: Implementing Client/Server Computing in Your Organization

Carl Schulz, *Vice President*
Software Development
GTE Data Services

One of the key issues for companies moving to open systems, Unix and client/server architectures, is the impact such changes will have on their IS organizations. IS executives must analyze and alter their existing organizations to meet the challenges of open systems, OOD and client/server. In addition, the new environment creates a variety of issues that will make new demands on the classical mainframe developer, and that must be resolved prior to implementation. For IS executives, the challenge is to marry the new and legacy systems in a seamless and consistent manner, while building a strong foundation of operations based on the IS organization's "best practices" and industry standards.

10:15AM–10:35AM **Coffee Break**

10:35AM–12:00PM **Never Mind What You Know; What Do You Believe?**

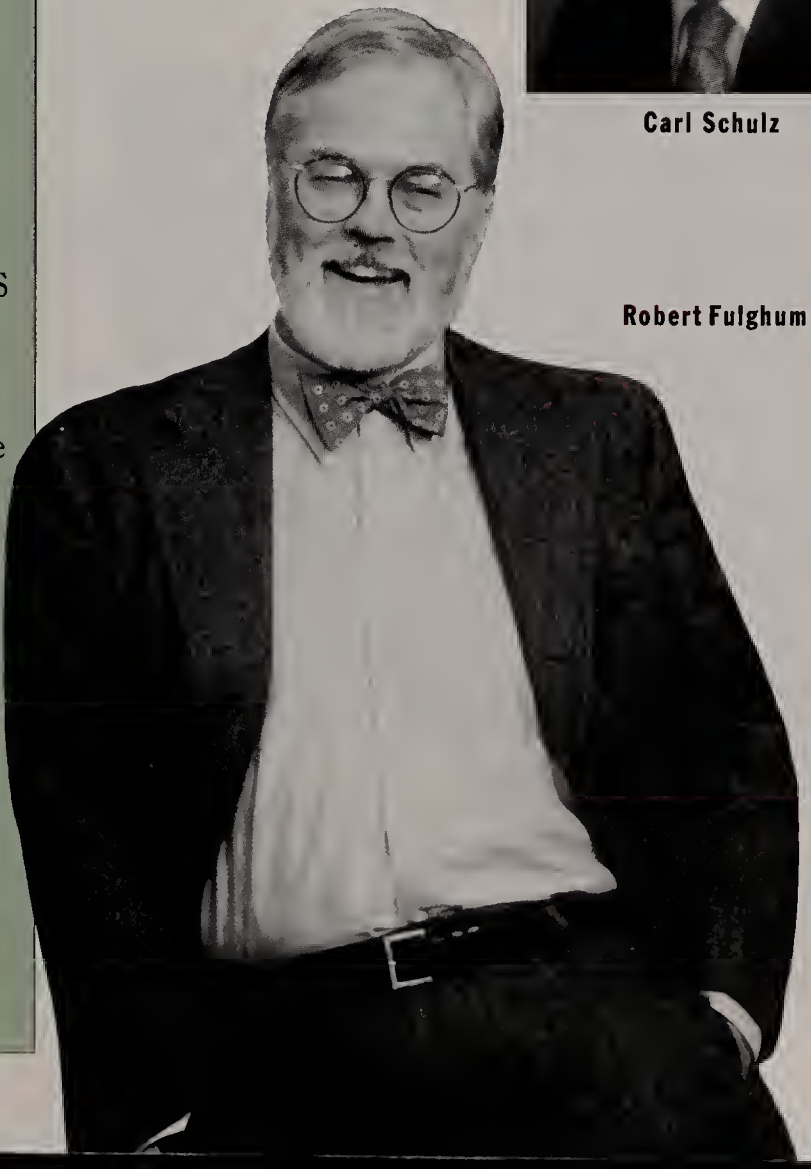
Robert Fulghum, *Author, Minister, Sculptor, Conductor & Existentialist*

A philosopher's point of view from the year 2192, drawn from what was happening in the years 92, 992, 1892, 1992 and 2092, and taken from that place where the bottom line, the big picture, making a living and making a life intersect.

Bob Steinkrauss

Ed Jebber

Carl Schulz



Robert Fulghum

Companion Program

This program is designed to allow companions to explore the sights of Boca Raton during the conference and join the participants for meals and social activities. A companion breakfast is scheduled for Monday morning to give everyone a chance to meet. Your CIO companion guide will greet you, review the planned activities and answer questions. After joining the conference participants for lunch, companions will tour the Loxahatchee Everglades, Florida's wetland habitat of rare and endangered species. This tour includes a narrated airboat ride through the Loxahatchee National Wildlife Refuge, a wildlife presentation featuring "up-close" encounters with inhabitants of the Everglades, and an environmental nature walk. Tuesday morning starts with a trip to the Henry M. Flagler Museum (Whitehall Mansion), former home of the cofounder of the Standard Oil Company. The museum is the magnificent 54-room mansion Mr. Flagler built for his wife in 1901; the rooms have been carefully restored to reflect the opulence of the era. "Whitehall" has been placed on the National Register of Historic Places.

After the museum, a shopping excursion to Worth Avenue, the premier shopping avenue of Palm Beach, is scheduled. We will return to the hotel in time for Paul Strassmann's keynote presentation, followed by a reception with Mr. Strassmann.

We've extended the Monday afternoon program to include all conference attendees, who must sign up in advance.

Companions must be enrolled in this program to participate in any of the conference functions, meals or sightseeing. Enrollment in this program does not include conference-session attendance.

Deann J. Shier

Deann J. Shier

SUNDAY, OCTOBER 11	
7:00PM–9:00PM	Networking Reception
MONDAY, OCTOBER 12	
9:00AM–10:00AM	Companion Breakfast
12:00PM–1:30PM	Luncheon with Conference Participants
1:30PM–5:00PM	Loxahatchee Everglades Tour
6:30PM–7:30PM	Reception
7:30PM–10:00PM	Dinner on the Beach
TUESDAY, OCTOBER 13	
7:00AM–8:00AM	Breakfast with Participants
9:30AM–11:30AM	Henry M. Flagler Museum Tour
12:00PM–3:00PM	Worth Avenue Shopping
5:30PM–6:30PM	Reception with Paul Strassmann
WEDNESDAY, OCTOBER 14	
7:00AM–8:00AM	Breakfast with Participants

Boca Raton Resort & Club

The five-star Boca Raton Resort & Club on Florida's Gold Coast is ideally situated between the Intracoastal Waterway and the Atlantic Ocean. Located on a 223-acre estate, it is one of the world's premier resorts and has won virtually every prestigious hospitality, dining and meeting honor.

Casual is the operative word at the Boca Beach Club, where stylish rooms overlook the ocean or the Intracoastal Waterway. The club is located on its own half-mile beach and features colorful, private beach cabanas, excellent restaurants and informal nightly entertainment.

Boca has two championship golf courses and 29 clay tennis courts on which single, double and round-robbin tennis tournaments are a daily activity. The resort has a 23-slip marina with sailing, powerboating, parasailing and fishing available. There are four indoor racquetball courts, a croquet course, basketball court and two fitness centers.

Special programs are available for children aged three through five and six through twelve: These can be arranged on a daily basis. Baby-sitting can also be arranged.

BOCA RATON, FLORIDA

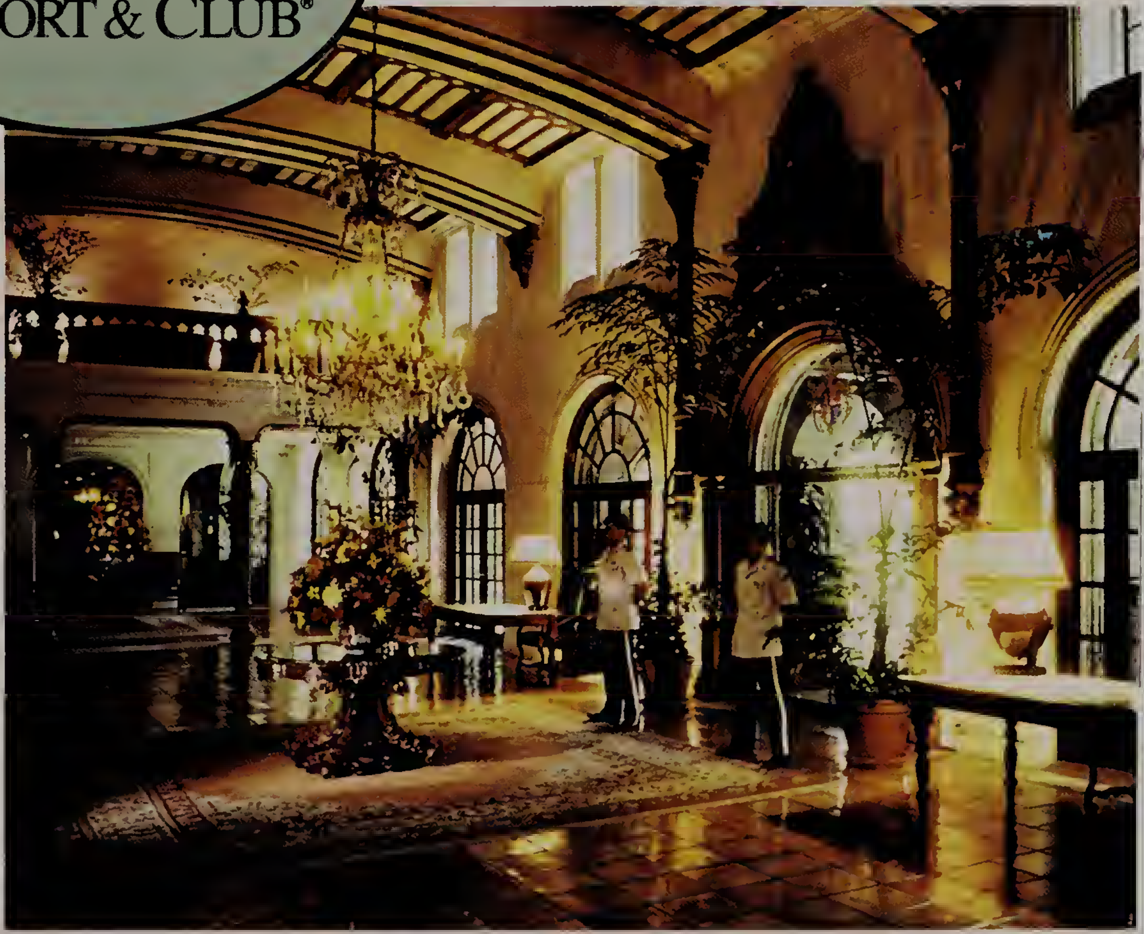
A tropical paradise with an average temperature of 76 degrees, beautiful beaches, year-round sunshine and a variety of activities, Boca Raton is equidistant from Fort Lauderdale and Palm Beach.

Boca Raton is a versatile city, offering something for every taste. For sports enthusiasts, the 25 golf courses and tennis facilities rank among the best anywhere. A day at the beach might include swimming, snorkeling, waterskiing, scuba diving and fresh- or salt-water fishing.

For those who appreciate the finer arts, Boca Raton and neighboring communities boast renowned museums and galleries: the Henry M. Flagler Museum (Whitehall Mansion), the Norton Gallery of Art, and the Society of the Four Arts. Dinner-theater productions and a wide variety of musical performances and concerts also take place nightly.

Boca Raton's abundance of shops and restaurants will satisfy the most avid shopper and discriminating gourmet. And everyone will enjoy horse racing, greyhound racing, polo, jai-alai, horseback riding, bicycling, sailing and sportfishing.

THE BOCA RATON RESORT & CLUB®



Corporate Hosts

Apple

APPLE COMPUTER

Apple Computer Inc. develops, manufactures and markets personal computer systems for use in business, education, science, engineering and government. A recognized pioneer and innovator in the personal computer industry, Apple does business in more than 120 countries. Apple has redefined computing to mean empowerment of the individual. It seeks through technology to provide people with easy and affordable access to information and computing power.

BOOZ·ALLEN & HAMILTON

BOOZ ALLEN & HAMILTON

Booz Allen & Hamilton is a global management and technology consulting firm dedicated to helping senior executives improve the performance of their institutions. Following the firm's Strategy-Driven Systems approach, Booz Allen professionals combine top-down management perspective with hands-on systems integration expertise to plan, develop and implement systems that change the way clients do business.

COMPUTER™ ASSOCIATES
Software superior by design.

COMPUTER ASSOCIATES

Computer Associates International is the leading independent software company in the world. CA develops, markets and supports integrated systems management, information and business applications software for a broad range of mainframe, midrange and desktop computers. CA serves the international marketplace through offices in 26 countries.

EDS
TAKE ADVANTAGE OF CHANGE℠

EDS

EDS is a leader in applying information technology to the needs of businesses and governments worldwide. Dallas-based EDS has spent 30 years helping customers achieve their business objectives. The company provides the following services: consulting, systems development, systems integration, systems management and process management. With operations in 30 countries, EDS has more than 70,000 employees. The company posted 1991 revenues of $7.1 billion.

hp HEWLETT PACKARD

HEWLETT-PACKARD

Hewlett-Packard Company is an international manufacturer of measurement and computation products and systems recognized for excellence in quality and support. The company's products and services are used in industry, business, engineering, science, medicine and education in approximately 100 countries. HP has 89,000 employees and had revenues of $14.5 billion in its 1991 fiscal year.

Lotus®

LOTUS DEVELOPMENT CORPORATION

Lotus Development Corporation, founded in 1982, provides software applications and services that meet the evolving technology and business needs of individuals, workgroups and entire organizations. During the 1980s, Lotus built its success by delivering innovative productivity tools to individuals using personal computers. With the introduction of Lotus Notes, a group collaboration software for networked PCs, the company is delivering applications in an open workgroup environment and addressing the primary imperatives for computing in the 1990s—networking and organizational computing.

NCR CORPORATION

NCR Corporation, the networked computing resource of AT&T, develops, manufactures, markets, supports and services enterprisewide information systems for worldwide markets. A product line based on an open, cooperative computing architecture and the NCR System 3000 line of computers meets the information processing needs of customers in a wide variety of markets, including retail, financial and general purpose. NCR products are sold through 1,100 offices in more than 120 countries. NCR has 55,000 employees worldwide.

NCR

NIELSEN MARKETING RESEARCH

Nielsen Marketing Research (NMR) is the world's leading marketing information services company, with offices in 28 countries. NMR is dedicated to providing customers with the highest quality information and decision support services using AI-based software, visual programming environments, EIS and ad hoc analysis and delivery systems. From its world headquarters in Northbrook, Illinois, Nielsen supplies a wide range of services and technologies that help consumer-goods manufacturers and retailers develop insights to make better business decisions.

Nielsen

RACAL-DATACOM

Racal-Datacom, a global union of 15 companies in 10 countries, is one of the world's leading independent providers of data communications products, systems and services. It is committed to supplying a broad range of integrated data communications technology and professional services capabilities that positively impact its customers' business goals. Racal-Datacom is supported by its U.K.-based parent company, Racal Electronics Plc., a more than $2.5 billion multinational firm, which owns in excess of 100 principal electronics companies worldwide.

Racal-Datacom™

TECHNOLOGY INVESTMENT STRATEGIES CORPORATION

Technology Investment Strategies Corporation helps corporate executives and managers around the world make their strategic business decisions about information technology. As a subsidiary of International Data Group (IDG), the world's leading provider of information on IT, TISC is well connected to the largest global network of information resources. TISC draws from this vast information network, spanning 49 countries, to provide its clients with a comprehensive set of research and consulting services dealing with the most critical information technology management issues of the day.

Technology Investment
Strategies Corporation

TEXAS INSTRUMENTS

Texas Instruments Incorporated, the I-CASE technology leader, is a high-technology company with sales and manufacturing operations in more than 30 countries. TI develops, manufactures and markets semiconductors, defense electronics systems, software productivity tools, computer systems and peripheral products, custom engineering and manufacturing services, electrical controls, metallurgical materials and consumer electronics products. At Texas Instruments, technological leadership and persistent commitment to quality have been the keys to success.

Texas
Instruments

CIO

CIO Perspectives℠
THE PROCESS OF IT:
Organizing for Success

Boca Raton Resort & Club
Boca Raton, Florida
Sunday, October 11–Wednesday, October 14, 1992

ENROLLMENT FORM

Please complete this form in its entirety. Thank you.

Name ____________________

Title ____________________

Company ____________________

Address ____________________ Mail Stop ____________________

City ____________________ State ______ Zip Code ____________________

Phone (   ) ____________________ Fax (   ) ____________________

What industry are you/your company in? ____________________

Your name as you want it to appear on your badge: ____________________

Name of Companion (if attending): ____________________

Additional Company Enrollment
The following people from my company also plan to attend:

Name ____________________ Companion ____________________

Title ____________________ Mail Stop ____________________

ENROLLMENT FEES

(Please include a business card.):

PRIOR TO JULY 31, 1992
IS Practitioners/Executives: If you are a CIO, IS executive or hold another executive non-sales/marketing position, the fee is **$995.**

Government/Military: The fee, which **includes your hotel for three nights,** is **$1,395.**

ON/AFTER AUGUST 1, 1992
IS Practitioners/Executives: If you are a CIO, IS executive or hold another executive non-sales/marketing position, the fee is **$1,195.**

Government/Military: The fee, which **includes your hotel for three nights,** is **$1,595.**

If you do not qualify for one of the above categories, the enrollment fee is $2,250.

All enrollment fees must be paid in advance of the meeting. Fee includes conference sessions, affinity group and break-out sessions, corporate host displays, conference materials and scheduled food and beverage. Transportation and hotel are your responsibility.

PAYMENT INFORMATION:

☐ Check Enclosed ☐ Bill Company

☐ Credit Card ☐ P. O. #

☐ AMEX ☐ VISA ☐ MC Exp. __________

Card # ____________________

Signature ____________________

FAX, CALL OR MAIL TO:

Fax to 508/872-0618; **call us** at 800/366-0246 or **mail to: CIO** Magazine, 492 Old Connecticut Path, Framingham, MA 01701. Attn: Executive Programs

COMPANION PROGRAM: $185

Companions must be enrolled in this program to attend any conference-related functions. (Includes all scheduled food and beverage functions, and two planned companion program activities. It does not include conference session attendance.)

HOTEL ACCOMMODATIONS:

A block of rooms has been reserved at the five-star Boca Raton Resort & Club. We urge you to make your reservations early by calling the hotel at 800/327-0101. Be sure to identify yourself as part of the *CIO* conference to receive the conference rate. Hotel reservations/cancellations and charges are your responsibility, except for government/military participants.

ATTIRE:

Casual! Please, no suits, ties or business attire!!

TRANSPORTATION:

American Airlines/Delta Airlines are the official conference carriers. Depending on your originating city, you can qualify for up to a 45% discount. Call American at 800/433-1790 and reference Star File #S0204S, or call Delta's Special Meetings Network at 800/221-1212 and reference File #B41084.
Shuttle bus transportation is available from Palm Beach and Fort Lauderdale airports.

☐ Check here for information on the children's program.

CANCELLATION:

You may cancel your enrollment up to 9/11/92 without penalty. Cancellation between 9/12 and 10/8 will receive full credit toward attendee at the next conference. No refund or credit will be given for cancellations received on or after 10/9, or for no-shows. You may send a substitute in your place.

NETWORKING/AFFINITY GROUPS:

A variety of activities is being planned for Monday afternoon. Please identify special interest group or affinity group sessions you are interested in attending:

____

____

____

____

____

OTHER ACTIVITIES:

Which Monday afternoon activities are you interested in?

☐ Golf ☐ Tennis ☐ Fishing

JL PJL AG PAG 1SP P1SP NR TST RES CH

Make The Most Of Your Editorial Coverage With Reprints From CIO

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

JULY 1989
VOLUME TWO
NUMBER TEN

TRENDLINES

DON'T FORGET THE NAILS

For the weekend renovator unaccustomed to drawing up workable plans and estimating and selecting building materials for do-it-yourself projects, the Weyerhaeuser Co. is now offering one of the more interesting computer-based kiosk applications.

Weyerhaeuser's DesignCenter, which debuted recently in building-supply and home-center stores, automates the project design and estimating process. While the marketing aim is to boost sales and employee productivity at the retail outlet, the added value to the do-it-yourselfer is in time, money and aggravation saved.

The system is fast (10 to 15 minutes to design a deck) and accurate (providing exact materials costs). Currently the kiosks are programmed only for decks, but garages, shelving units and other projects will be added to the system soon.

To operate the kiosk, a store employee uses a simple trackball device to prompt the customer through the design. Customers can opt for a deck that is either attached to the house or not, anywhere from ground level to six feet high, with one level or two.

Once the dimensions are set, the customer chooses the type of decking and the direction it will run in. A variety of railing styles are offered, with different balusters and headers, depending on the customer's tastes and budget. The system automatically sets the correct joist, beam and support-post placement.

Finally, when the design is complete, the system displays a detailed, 3-D image that can be manipulated on screen to show any angle, top to bottom, right to left. Another prompt shows the cost of materials for the current design. Too expensive? Try a simpler baluster style or trim down the square footage—then compare the two designs and costs side by side.

When the customer chooses a final plan, the DesignCenter prints out a 3-D color depiction of it, along with construction details, an itemized materials list (with current prices) and a "how-to" booklet on basic deck construction. (These are usually available only with the purchase of the project.)

The DesignCenter, which has been nominated for the *Computerworld*/Smithsonian awards for technology innovation, is the product of Innovis Interactive Technologies, a subsidiary of Weyerhaeuser. The kiosk was created, said Innovis President Mark Lembersky, as "a way to provide a value-added [service] to retailers that would help improve the store's image and sales and, at the same time, deal with the shortage of skilled workers on the store floor." Lembersky called the kiosk "remarkably easy to use," and reported that "almost all salespeople become proficient in 15 minutes."

Reprinted through the courtesy of *CIO Magazine*.
© 1989 CIO Publishing Inc.

Coverage in CIO of your company's products, services or innovative activities means valuable exposure in a broad spectrum of markets. Build on the positive impact by ordering your reprints today.

Editorial reprints make great leave-behinds for:

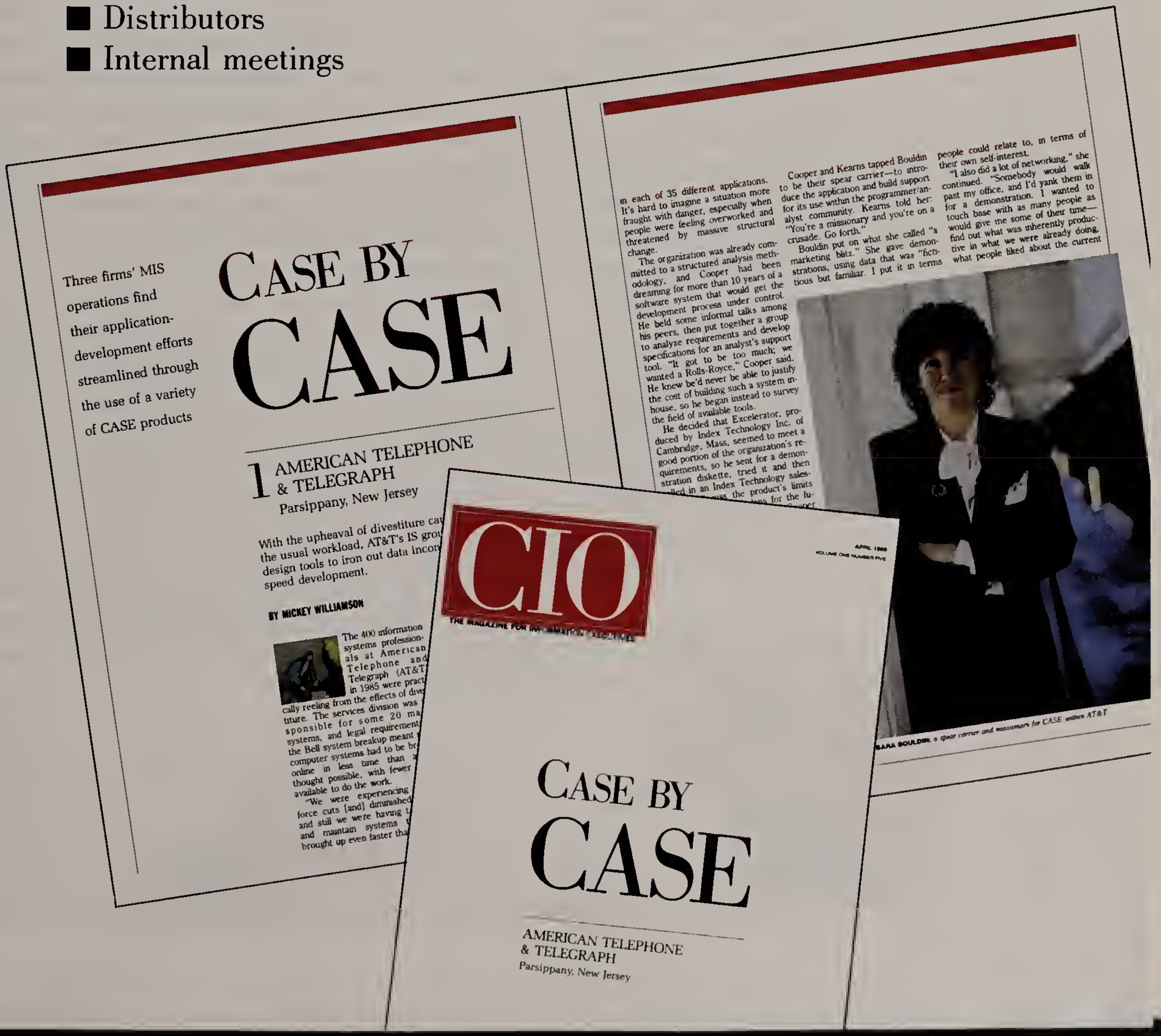
- Press
- Sales prospects
- Company seminars
- Trade shows
- Distributors
- Internal meetings

Reprints can be customized to include your advertisement, company logo, address and sales office listing.

For more information, call:

Walter Manninen
508-935-4101

CIO Publishing
492 Old Connecticut Path
P.O. Box 9208
Framingham, MA 01701



Three firms' MIS operations find their application-development efforts streamlined through the use of a variety of CASE products

CASE BY CASE

1 AMERICAN TELEPHONE & TELEGRAPH
Parsippany, New Jersey

With the upheaval of divestiture ca
the usual workload, AT&T's IS grou
design tools to iron out data incon
speed development.

BY MICKEY WILLIAMSON

The 400 information systems professionals at American Telephone and Telegraph (AT&T in 1985 were pract cally reeling from the effects of dive titure. The services division was sponsible for some 20 ma systems, and legal requirement the Bell system breakup meant computer systems had to be br online in less time than thought possible, with fewer available to do the work.

"We were experiencing force cuts [and] diminished and still we were having t and maintain systems brought up even faster tha

in each of 35 different applications. It's hard to imagine a situation more fraught with danger, especially when people were feeling overworked and threatened by massive structural change.

The organization was already committed to a structured analysis methodology, and Cooper had been dreaming for more than 10 years of a software system that would get the development process under control. He held some informal talks among his peers, then put together a group to analyze requirements and develop specifications for an analyst's support tool. "It got to be too much; we wanted a Rolls-Royce," Cooper said. He knew he'd never be able to justify the cost of building such a system in-house, so he began instead to survey the field of available tools.

He decided that Excelerator, produced by Index Technology Inc. of Cambridge, Mass., seemed to meet a good portion of the organization's requirements, so he sent for a demonstration diskette, tried it and then lled in an Index Technology sales- uss the product's limits ons for the fu-

Cooper and Kearns tapped Bouldin to be their spear carrier—to introduce the application and build support for its use within the programmer/analyst community. Kearns told her: "You're a missionary and you're on a crusade. Go forth."

Bouldin put on what she called "a marketing blitz." She gave demonstrations, using data that was "fictitious but familiar. I put it in terms people could relate to, in terms of their own self-interest.

"I also did a lot of networking," she continued. "Somebody would walk past my office, and I'd yank them in for a demonstration. I wanted to touch base with as many people as would give me some of their time—find out what was inherently productive in what we were already doing, what people liked about the current

ARA BOULDIN: a spear carrier and missionary for CASE within AT&T

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

APRIL 1988
VOLUME ONE NUMBER FIVE

CASE BY CASE

AMERICAN TELEPHONE & TELEGRAPH
Parsippany, New Jersey

A Misguided Effort

Trying to evaluate the bottom-line contribution of IS is a waste of time

BY ROBERT A. WALDMAN

How comforting it would be to have a concrete, dollar measure for every function's business value to the organization. But executives chasing after such a figure for IS are wasting their time. While the productivity of developers is an appropriate subject for quantitative measurement, no figure for a system's value to a company can credibly be assigned. Rather, business value is a measurement that should be made of the business units responsible for deciding whether systems are built and, ultimately, for funding their development.

The recent emphasis on quantifying the contribution of IS to the bottom line is a result, in part, of the increasingly widespread perception of that function's expanding role. In this well-intentioned but unrealistic view, IS staff would all be talented businesspeople working as equal partners with the business units to design systems that will benefit the company. The CIO in this scenario is a key member of the executive team, intimately involved in planning and strategy-making: someone who plays a leadership role, even if that means occasionally ignoring the expectations of some managers.

In the real world, however, IS staff are generally about 80 percent technology-oriented and only 20 percent business-oriented. And the CIO does not "bestride the narrow world like a Colossus"; rather, he or she is primarily responsible for ensuring that IS operates as efficiently and productively as possible. Undeniably, the more IS staff know about the business side, the better. And CIOs do serve an essential strategic purpose: keeping executives up-to-date on coming technologies, making recommendations on which systems to fund and helping to keep the company competitive by delivering systems as quickly and cheaply as possible. But building systems is not the same as deciding which systems should be built. It is on the former capability that IS should be evaluated.

This is not to say that the CIO need not be a good businessperson. On the contrary, IS executives must understand their organizations' objectives in order to help guide their technology decisions, and be familiar enough with the business side to move comfortably throughout the corporate environment. In addition, these executives must be able to judge when to take risks, assess the potential payback for new technologies and train their staffs in the business of selling IS to the business side.

But the real business of the CIO is determining which products to bring in, deciding whether to stay in a mainframe environment or move to distributed computing, weighing the benefits of outsourcing—in short, running IS.

Because IS has the power to advise but not consent, it should not be evaluated on the benefits that its systems return to the corporation. Rather, it should be judged by how effectively it builds the systems that the business side has decided are important. The job of determining which systems will most benefit the business belongs to those with the training and responsibility for producing bottom-line profit.

The need to measure productivity in accord with responsibility makes attempts to evaluate the bottom-line contribution of IS inappropriate. The very nature of IS makes them futile. Trying to assign a hard dollar figure to the value of systems is like asking how much income the human-resources department brings to the company. That both functions are essential is indisputable, but the value they contribute is indirect. Moreover, the soundness of a decision to build one system over another is subjective.

The wisest course, then, is to forget about areas that are not conducive to meaningful measurement and concentrate on those that are. Work output, quality and operational efficiency are all appropriate subjects for scrutiny, through such metrics as function points, user surveys and comparison with original cost estimates.

The IS organization should be proud of its position as a key staff function, and content with helping the company remain competitive by influencing decisions within the department. But leave the business of measuring business value where it belongs—with the people responsible for profits. CIO

Robert A. Waldman is the director of Real Decisions Corp., a comparative-analysis firm in Darien, Conn.

ILLUSTRATION BY HAL MAYFORTH

A Call for Entries

Wanted: Many Happy Returns

CIO's January 1993 issue will focus on the return on investment of information technology (ROI/T). We are looking for companies, government agencies and not-for-profit organizations that have improved their bottom line through the use of IT—and have the hard numbers to prove it.

We'd like to hear from you if:

- you can demonstrate the dollar-value ROI of a major IT solution;
- your system is aligned with your enterprise's key strategic goals;
- your system has been in operation for at least 18 months; and
- you agree to be featured as one of the case studies in the January issue of *CIO* Magazine.

Submissions must be received by August 21, 1992. Please return the form on the back of this page, along with the additional information requested, to Allan Alter, special projects editor, via fax to 508 879-7784, or by mail to CIO Publishing Inc., 492 Old Connecticut Path, PO Box 9208, Framingham, MA 01701-9208.

All submissions must be made by IS executives and include all of the specified information. Selection of profile candidates will be based on a variety of factors not limited to total dollar impact. Companies selected for consideration will be contacted by a representative of CIO Publishing for further details and verification.

Please call Allan Alter at 508 935-4729 if you have questions.

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

PHOTO BY RALPH MERCER

ROI/T SUBMISSION FORM

Please print or type. Fax this form to 508 879-7784 or mail to address on reverse. Submissions must be received by August 21, 1992.

Organization Information

Name of organization/business unit:

Address:

City: State: Zip:

Description of business: Industry:

IS executive making submission: Title:

Telephone: Fax:

Signature:

Name of non-IS executive sponsor for whom system was developed:

Title: Telephone:

Description of System & ROI Methodology

- On a separate sheet of paper, please type a description of the system in 300 words or less. Include: the system's date of implementation; its business objective; what it actually does; its users, enabling technologies and technical platforms (including major vendors); the overall benefits it has provided to the business, and its "soft" returns (e.g., employee motivation, better decision-making).
- Also, please briefly describe the methodology your company uses to determine the dollar-value return of IT investments.

Return on Investment

Gross Return:

Additional revenues attributed to system (e.g., new revenue streams, additional revenues on existing products): $

Direct cost savings (e.g., labor, material): $

Increased productivity (e.g., more goods produced, better customer service): $

Indirect cost savings (e.g., new hiring avoided, penalties from government regulators avoided): $

Total: $

Costs:

Acquisition costs (e.g., hardware, software development, systems integration, training): $

Maintenance costs (e.g., updating system, maintaining and replacing software, adding users): $

Operating costs (e.g., ongoing training and consulting, help desks, other ongoing support): $

Amortization of equipment (if applicable): $

Total: $

Net Return on Investment (Gross Return less Costs): $

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

A World of Difference

Computer manufacturers in the East and West agree on the importance of achieving quality in all facets of their businesses. But on the question of how to go about it, the twain don't meet.

BY L. SCOTT FLAIG

A new emphasis on quality practices among computer-hardware manufacturers will give senior IS managers and their organizations greater influence over product specification and design. A study by Ernst and Young and the American Quality Foundation shows that, in response to increasing pressure to improve performance, vendors are soliciting customer input regarding product performance, new product features and communications for managing the business process of order entry and fulfillment.

This evolving IS role is a key finding of The International Quality Study, which spanned two years and involved more than 116 computer manufacturers in the United States, Canada, Germany and Japan. The study addressed business organization, new-product and -services development, the delivery process and customer satisfaction, and quality and strategic positioning. While quality is on the agenda of companies worldwide, the study demonstrated major differences in emphasis between the three Western countries and Japan.

ILLUSTRATION BY MARK FISHER

Companies in the United States, Canada and Germany report that they are poised to make a major leap in adopting quality practices in all facets of their businesses—including customer relationships, new product design and manufacturing, and executive evaluation and compensation. The Japanese—world leaders in applying quality management techniques—are refining current practices rather than making major innovations.

An examination of company strategies and plans indicates that many vendors, especially in the United States, may have unrealistic expectations of the quality improvements they can make in the next three years. Regardless of their success, the mere fact that computer companies are emphasizing quality will alter the vendor-user relationship.

Computer companies say they will dramatically increase customer participation in cross-functional teams to help translate user-perceived needs into new-product design specifications. The percentage of companies reporting that they usually or always use "cross-functional teams that include customers" has risen from 29 percent three years ago to 39 percent today, and 70 percent say they will do so in three years.

Computer manufacturers will also increase their use of new-product design review by customers, design review by in-house multidisciplinary and technical teams, customer representatives on review teams, customer pilot runs (beta-site tests) and customer-use simulation.

In addition, manufacturers seeking to improve their internal processes are becoming more attuned to customer complaints. In fact, reducing customer complaints took precedence over reducing costs, errors or cycle time as the key measure of process improvements.

While there was universal agreement that customer input is critical to developing new products, the use of customer-complaint systems varied. In Japan and Germany, more than 60 percent of respondents said these systems are of "major or primary" importance, while in the United States and Canada, fewer than 30 percent of respondents place much emphasis on such systems. But the study indicates that in three years, U.S. and Canadian companies will be using customer-complaint information at nearly the levels that German and Japanese companies are now.

While the companies diverged in their approaches to customer complaints, they all plan to increase their reliance on such techniques as staying abreast of the state of the art, conducting technological forecasting, keeping track of competitors and devising their own marketing plans to anticipate customer demand. Japan in particular is emphasizing technological forecasting as a competitive tool.

> *German companies lead the others in plans to make their teams autonomous.*

An increased emphasis on employee training is a further indication that companies are concerned about the quality of customer-vendor interaction. Vendors are inculcating their employees—particularly new ones—with the skills necessary to interact effectively with their customers.

More good news for IS professionals: Vendors are stressing that an efficient delivery system is crucial to their operations and marketing. This is because the rise of decentralized computing and networked environments has changed customers' buying patterns. New equipment is more frequently purchased on an "as-needed" basis, without the lengthy sales cycle, approval process and preparation time that characterized centralized computing. Hardware is becoming more of a commodity, which means that price and fast delivery are major purchasing considerations.

Vendors from all four countries agree that improving business processes is a major leverage point for boosting overall performance. They are predicting that process-capability studies, process simplification and process cycle-time analysis will be commonplace in their companies three years from now. However, these practices are not now in widespread use in the United States and Canada, and the road ahead may be rocky. Implementation calls for

KEY QU

Can you cut costs and really

EDS helped Blue Cross and Blue Shield of Massachusetts answer yes.

New information systems developed by EDS help Blue Cross and Blue Shield **better serve the Medicare program, providers and recipients**. All while reducing operating costs.

At the heart of the system is new optical imaging technology. It scans and captures 100,000 pages of claims and correspondence each day. This **improves the accuracy of processing** by providing access to an image of the original document.

And because access is immediate, the time required to file and retrieve documents is dramatically reduced. The insurer's staff can call up electronic

EDS is a registered trademark of Electronic Data Systems Corporation. © 1992 EDS.

rigorous discipline and a commitment to radical change. The cultural upheaval in many companies will be monumental.

All companies surveyed agreed that they must design and build quality into their products rather than rely on inspection, rework and field repairs. Three years ago, 84 percent of the Japanese companies gave this item top priority, compared to only half that number in the West. Today, all three Western countries plan to nearly eliminate the after-sales-repair approach.

Manufacturers diverge widely on the role of their quality-assurance (QA) staffs. For the Japanese and Germans, QA functions as the enforcement group, a role that the Americans and Canadians downplay. In Japan, failure analysis and problem solving are also important. Although "education and championing" or "facilitation" are not currently major QA roles, their importance will increase, especially in the West.

All of these changes are dramatically affecting how computer companies evaluate and reward their senior managers. Company profitability continues to be a major performance criteria. But individual performance is losing ground to team performance as the primary factor in determining compensation.

The survey respondents also said that overall quality performance was an increasingly important measure. Yet Western corporate culture still tends to place undue emphasis on achieving short-term profitability. Companies will need a strong hand at the helm to achieve more balance in rewarding senior managers.

The most radical activity in implementing quality practices will occur in the West. Canadian and U.S. companies are planning to greatly expand their use of teams, ranging from quality circles to self-managed work teams. Customer interaction is on the rise and, internally, business-process reengineering and the use of techniques such as cause/effect analysis, statistical process control and flow-charting are increasing.

German companies in particular are emphasizing cross-functional improvement teams and self-managed work teams. They also lead the other countries in plans to make their teams autonomous, while Japanese organizations want to increase management control of quality teams.

No matter what the outcome, the fact that quality is now a major worldwide goal of computer manufacturers will benefit top IS managers. Not only will they be able to acquire better-designed, more-reliable products, but they will have a major voice in shaping future products to meet evolving IS needs.

L. Scott Flaig is co-national director of Ernst & Young's Manufacturing/High-Tech Industry Services and a consulting partner at the company's Center for Information Technology and Strategy in Boston.

ESTION:

improve customer service?

images and records instantaneously from any desktop workstation. The increase in speed and accuracy avoids delays in payments. **Physicians and their staffs save time**. And the insurer's productivity has improved.

"We reduced operating costs dramatically," said Lou Resca, Vice President of Government Operations for Blue Cross and Blue Shield of Massachusetts. "But the ultimate beneficiaries of the improvements are America's elderly patients. It's a win-win solution."

Changes in technology create opportunities to **improve customer service** and reduce costs at the same time. To learn more, contact EDS, the world leader in applying information technology. Write Barry W. Sullivan, Director of Marketing, EDS, 7171 Forest Lane, M19, Dallas, TX 75230. Or you can call us at (214) 490-2000, ext. 119.

EDS

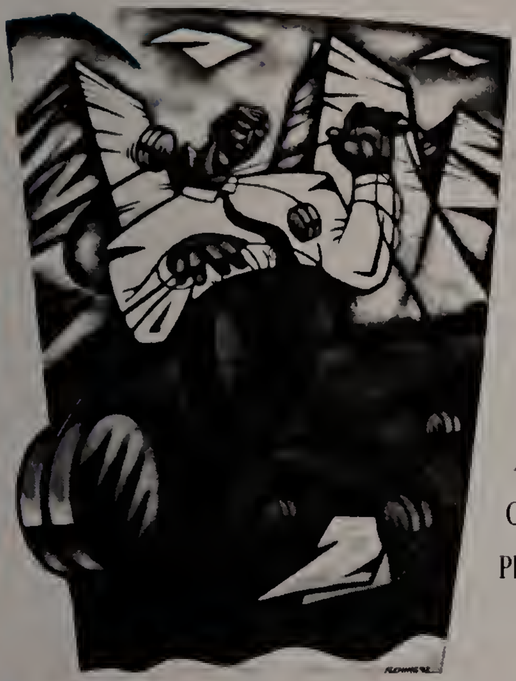
Barcelona '92

OFFICIAL RESULTS INFORMATION SYSTEM OF THE OLYMPIC GAMES

FLEMING 92

Yes, I have too many yo-yos.

Please send me more information about RemoteWare™!



About how many remote sites/mobile users do you have?
☐ less than 50 ☐ 50-200 ☐ 200-500 ☐ more than 500

What system do you use to exchange information with them now?
☐ Public Data Networks
☐ Mainframe Based Polling System
☐ In-house Developed Polling System
☐ US Post Office
☐ Express Mail Service
☐ Other__________
☐ None

Are you in the market for a better system? ☐ yes ☐ no

Name____________________Title________________
Company____________________________________
Address____________________________________
City______________State____Zip Code____________
Phone____________________Fax________________

REMOTE WARE™
Communicating Applications

XCELLENET®

Code CIO

NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 17693 ATLANTA, GA

POSTAGE WILL BE PAID BY ADDRESSEE

XcelleNet, Inc.
Marketing Services
5 Concourse Pkwy. Suite 200
Atlanta, GA 30328-9772

The man with too many yo-yos.

So you're in charge of information systems, usually, for this sprawling operation with hundreds of locations in faraway places populated almost exclusively by people who, hopefully, are better at their jobs than they are at using PCs to communicate back and forth with the home office, plus a growing gaggle of near-impossible-to-support mobile users, when this "Memo" from the corporate stable of Harvard prodigies with perfect teeth hits your desk with an ominous thud and a casual mandate that you whip this puppy into a "networked electronic enterprise" which, translated, means info on yesterday's operations consolidated and delivered to every manager's PC by 8:00AM their time, no matter where it is (whoa!), using forms-based workflow to and from central site SQL databases, not to mention ad hoc query capabilities for those mobile PCs, electronic ordering from suppliers and the electronic delivery of text and graphics-based order forms and catalogs direct to your customers' PCs, all of which raises the specter of homebrew polling solutions and the agony of long-term support for in-house-developed applications, and you start to feel that bad kind of sweat making an executive form of diaper rash around the inside of your collar right up until you decide to take a closer look at that RemoteWare™ proposal from XcelleNet® which was specifically designed to tame your yo-yo-like network via communicating applications that use low-cost, occasional connections over all kinds of telecommunications facilities, and are created and delivered electronically to remote and mobile PCs by operations managers without adding to the already-nasty programming load of your beleaguered staff and sparing acres of innocent rain forests from unnecessary slaughter, so you call the XcelleNet guy and he's calm so you're calm and you route your polite "I'm way ahead of you" response back to Mr. Ivy League MBA, and that's when you get this amazingly complimentary call from the boys on the Board....and they want to make you president or something.

REMOTE WARE™
Communicating Applications

To find out how RemoteWare information delivery systems solve problems for hundreds of organizations in over a dozen industries, call 1-800-322-3366. **XCELLENET**®

XcelleNet and RemoteWare are trademarks of XcelleNet, Inc.

© 1992 XcelleNet, Inc.

JOHN PURSER *"It's my belief that companies shouldn't necessarily own IS if IS isn't truly strategic to the business."*

FOR SALE:

ONE COST CENTER, *Slightly Used*

Libbey-Owens-Ford's CIO liked the IS group so much, he bought it

PHOTOGRAPHY BY JACK VAN ANTWERP

Despite all the talk about strategic information systems and competitive advantage, the unfortunate reality at many companies is this: IS's chief contribution is to the girth of capital and operational budgets. Some firms try staff layoffs, hardware outsourcing or downsizing to trim the fat. Glassmaker Libbey-Owens-Ford Co. considered all three options to meet its mandate to reduce IS costs by at least 20 percent. Nothing proved effective until the Toledo, Ohio-based manufacturer tried something radical: It sold the IS shop to its own IS director—who then turned around and signed up Libbey as his first outsourcing customer.

After more than a year and a half, the results of this unusual buyout/outsourcing arrangement have exceeded all expectations. Libbey has seen its processor upgraded and average uptime boosted five percentage points—even while freezing capital budget growth. The firm exceeded its targeted 20 percent reduction in costs within the first year of the 10-year contract, according to Darryl Costin, vice president and general manager of Libbey's flat-glass business unit and head of research and development and information technology. The newly formed outsourcer has committed to (and so far delivered) a savings of $2 million a year based on previously projected costs.

BY RICHARD PASTORE

The buyout was an admittedly desperate solution to a money crunch exacerbated by the extended recession. In the middle of 1990, chief executives of the billion-dollar company ordered all department budgets cut by at least 20 percent. The 80-person IS department was already teetering on a crumbling foundation. "Senior management regarded the value of MIS as below average," Costin said. The group was most notable for the high level of capital and operational costs it demanded. "It seemed every other year there was a multimillion-dollar capital request. We wanted to eliminate that."

Libbey laid off 10 percent of its IS workers, but the level of savings didn't meet the corporate mandate. "Then we looked at traditional outsourcing options and asked IBM and EDS for a quote," Costin said. But even these vendors couldn't promise the desired savings. Next Costin investigated the downsizing route, which would have offloaded processing from the IBM 3084 Model Q host to a network of personal computers. That didn't even come close to the target. "We legitimately tried every route we could think of, with no success. In the meantime, the pressure was mounting."

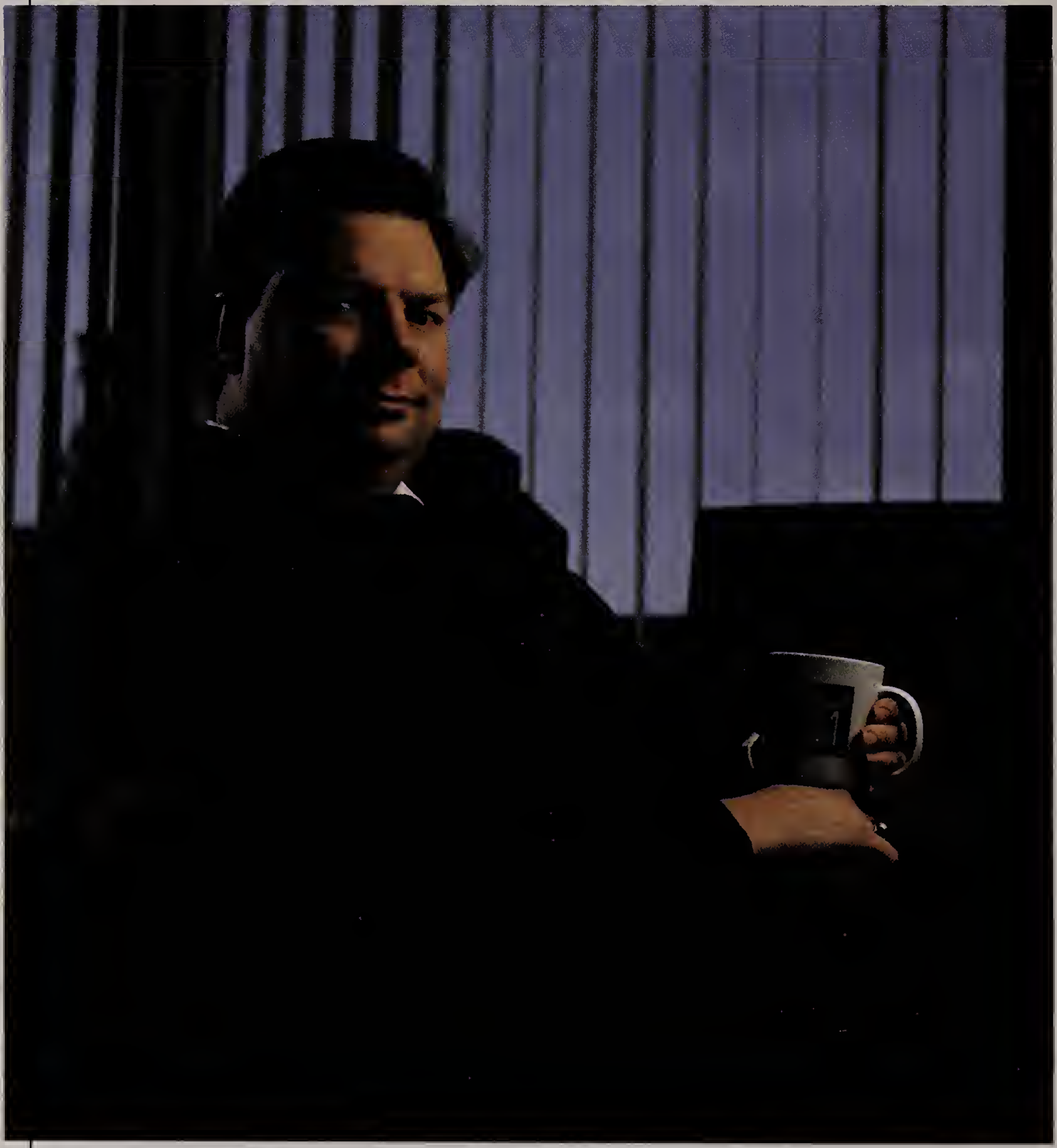
> *Three months after coming aboard as Libbey's IS director in May 1990, Purser bought out the IS assets and went into business as an outsourcer.*

Enter John Purser, 38, former manager of systems development at Inland Steel Co. and a 1989 graduate of Notre Dame University's MBA program (his computer-science degree came from Purdue University in 1976). Purser argued that the problem wasn't that IS was doing a poor job, but that Libbey was shelling out more investment dollars than its inherently nonstrategic systems warranted.

"In the '60s and '70s, top executives felt the more money they paid for IS, the more it would bring strategic advantage," said Purser, whose steel-industry background exposed him to this fallacy. "Many top executives still believe all IS work is strategic, but systems like general ledger and payroll do not make you more competitive in the marketplace." In reality, most systems considered critical by management will never amount to a hill of beans strategically, he concluded.

These applications, and even the few truly strategic systems, can usually be run more cheaply by someone on the outside, Purser argued. "It's the information that's strategic, not how it's processed and delivered. If someone can operate it more cheaply, they should."

The "someone" turned out to be none other than Purser. Three months after coming aboard as Libbey's IS director in May 1990, Purser bought out the IS assets and went into business as an outsourcer.



TOM CONROY *contributes expertise in mainframes and WANs.*

The notion of an insider incorporating a firm's own IS department took its cue from a similar stunt pulled off by a Swedish affiliate of Libbey's British parent, Pilkington Ltd. Back in Toledo, the buyout technicalities

Informix Database Technology Helps Kmart Know What Its Customers Want.

When Kmart wanted to move ahead in the highly competitive retail industry, they turned to us, Informix, and our experts in UNIX® relational database management systems.

Inventory Control Nationwide.

Kmart needed a fault-tolerant database that linked order entry, price verification, shelf-price updates, and complete inventory control for over 2,500 stores nationwide.

Kmart chose the Informix UNIX-based solution.

Hand-Held, Radio Frequency Computing.

With its new information network, multiprocessors, and hand-held DOS radio frequency computers, shelf pricing and complete inventory control are easily managed in less than a minute directly from the store floor.

The information from the database allows Kmart to make better decisions that help keep products on shelves, give faster check-out service, and keep excess inventory at a minimum—all of which helps Kmart keep a step ahead of the competition.

Kmart and thousands of other companies have called on us for 12 years to successfully handle their critical data.

If you're considering UNIX for data management, talk to Informix. Because we're the experts.

Call 1-800-688-IFMX.

INFORMIX

THE UNIX DATABASE EXPERTS.

© 1992 Informix Software, Inc. Informix is a registered trademark of Informix Software, Inc.
All other names indicated by ® or ™ are registered trademarks or trademarks of their respective manufacturers.

consumed three months, after which Purser's newly christened Computer Technology Management (CTM) Inc. wound up with Libbey's applications, some of its hardware and about half its IS staff. All that remained of Libbey's IS shop were four managers (to act as IS-business liaisons for new development projects), one telecommunications manager and several-hundred PCs linked to the outsourcer's off-site host.

Purser quickly re-outsourced Libbey's hardware operations and maintenance to Genix Corp. in Dearborn, Mich. Genix could run the systems more cheaply on its IBM 3090 and provide Libbey with better response time than the antiquated inhouse 3084. With hardware run by a third party, Purser's CTM could concentrate on the facilities- and applications-management and development side of the business.

Purser passed his IS-director baton to Tom Conroy, a former Inland Steel IS worker who followed Purser first to Libbey-Owens-Ford and then to CTM. Conroy contributes the expertise in mainframes and wide area network communications an outsourcing vendor particularly needs, Purser said. Purser completed the personnel portion of the transition by adding a director of marketing and five employees from a small Detroit-based PC-training company he had also acquired.

According to Costin, the buyout never would have worked without a strong, dedicated senior manager. "John Purser was a critical factor, and it's largely a result of his leadership that this came off," he said.

Yet despite Purser's leadership skills and MBA pedigree, Libbey-Owens-Ford entered into the pact with trepidation. "There are so many things that could have gone wrong with this: link problems, missed shipments, not invoicing customers properly, no strong commitment to fixing problems, lack of security," Costin said. "We had no idea what would happen." Nevertheless, the anticipated savings justified the risk.

Even with all these operating risks, the most widespread concern of companies considering outsourcing is more emotional than operational, according to Purser. "The philosophy is, 'I have to own everything to maintain control'" he said. To overcome this fear, Purser preaches his gospel of non-strategic-systems outsourcing. "It's my belief that companies shouldn't necessarily own IS if IS isn't truly strategic to the business."

But the toughest part of Purser's new role as a vendor president and CEO is not wooing potential clients; it's trying to reengineer the culture of a former IS shop into that of an independent, for-profit business. "You have to bring in management techniques much different [from] an inhouse DP group," he said.

One task the former Libbey shop handles differently from before is maintenance. As an in-house shop, it proved nearly impossible to analyze the details and costs of system maintenance. "Too often maintenance and development are blurred together, and there's no clear idea of how much you're spending," Purser said. As a profit-making venture, Purser's firm tries to isolate and analyze cost/benefit ratios of maintenance on a day-to-day basis.

One thing that hasn't changed is the competition. Like many in-house IS departments, Libbey found itself competing against outsourcing vendors for its very survival. Following the buyout, the group still competes with the likes of Andersen Consulting and EDS, only now it's for outsourcing contracts. While these big players seek 10-year contracts in the hundred-million-dollar range, Purser's firm typically pursues three- to five-year pacts valued at $1 million to $20 million. Purser said he is also willing to turn to third-party developers when it's evident CTM doesn't have the skills to handle a given project.

Having your own IS shop as your outsourcer offers two unique advantages: instant familiarity and uppermost attention. Since Libbey IS employees make up the core of CTM, the vendor was immediately and intimately familiar with its client's business and systems needs. In contrast, for Libbey "to bring in a blind group would be a major risk," Costin said. And when it comes to attentiveness, CTM "treats us like you would expect a number-one customer to be treated," Costin noted. "Frankly, I don't think we'd have patience with anything less."

For readers thinking of buying out their own IS departments, Purser has a few words of advice. "This has to be done so that top executive management understands the risks and opportunities," he said. "It can't be an inside raider-type job." Purser's MBA background was a prerequisite for pulling it off, he believes. As for finances, CIOs should make certain there is enough capital set aside to buy the assets. "When you have some idea of how much capital you need, go ahead and double it," Purser said. "People always underestimate the real costs." CIO

The Shape of IS

Before the Buyout	*After the Buyout*
Costs: Rising 12 percent per year, minimally	**Costs:** Reduced $2 million a year based on previously projected costs
Hardware: Leased IBM 3084 Model Q	**Hardware:** Outsourced IBM 3090 500J
Uptime: 94.5 percent	**Uptime:** 99.5 percent
Staff: 80 people	**Staff:** Five on Libbey's payroll
Director: John Purser	**Outsourcing vendor:** John Purser's CTM

NOW THIS IS WHAT WE CALL DOWNSIZING!

Goodbye ol' mainframe computer!
Industry leaders have already decided:
They're going to faster/smaller/less expensive computers based on open systems standards. And Data General is leading the way! Our AViiON® Systems can give you 117 MIPS of mainframe power that fits in a pizza box for a downsized starting price of under $100,000!
Unbelievable, you say? Believe it, we say!
Here's what AViiON can mean to your business:

- Increased savings because AViiON costs millions less than traditional mainframes–plus you save on maintenance, software, power, etc.
- Increased productivity because AViiON allows your different computers to work together as a corporate resource.
- Increased information storage capacity and security thanks to the availability of AViiON's fault tolerant disk array.
- Increased and immediate "mainframe class" performance using the leading databases, business applications and communications software.
- Increased envy from your competitors because you took advantage of open systems for a competitive edge.

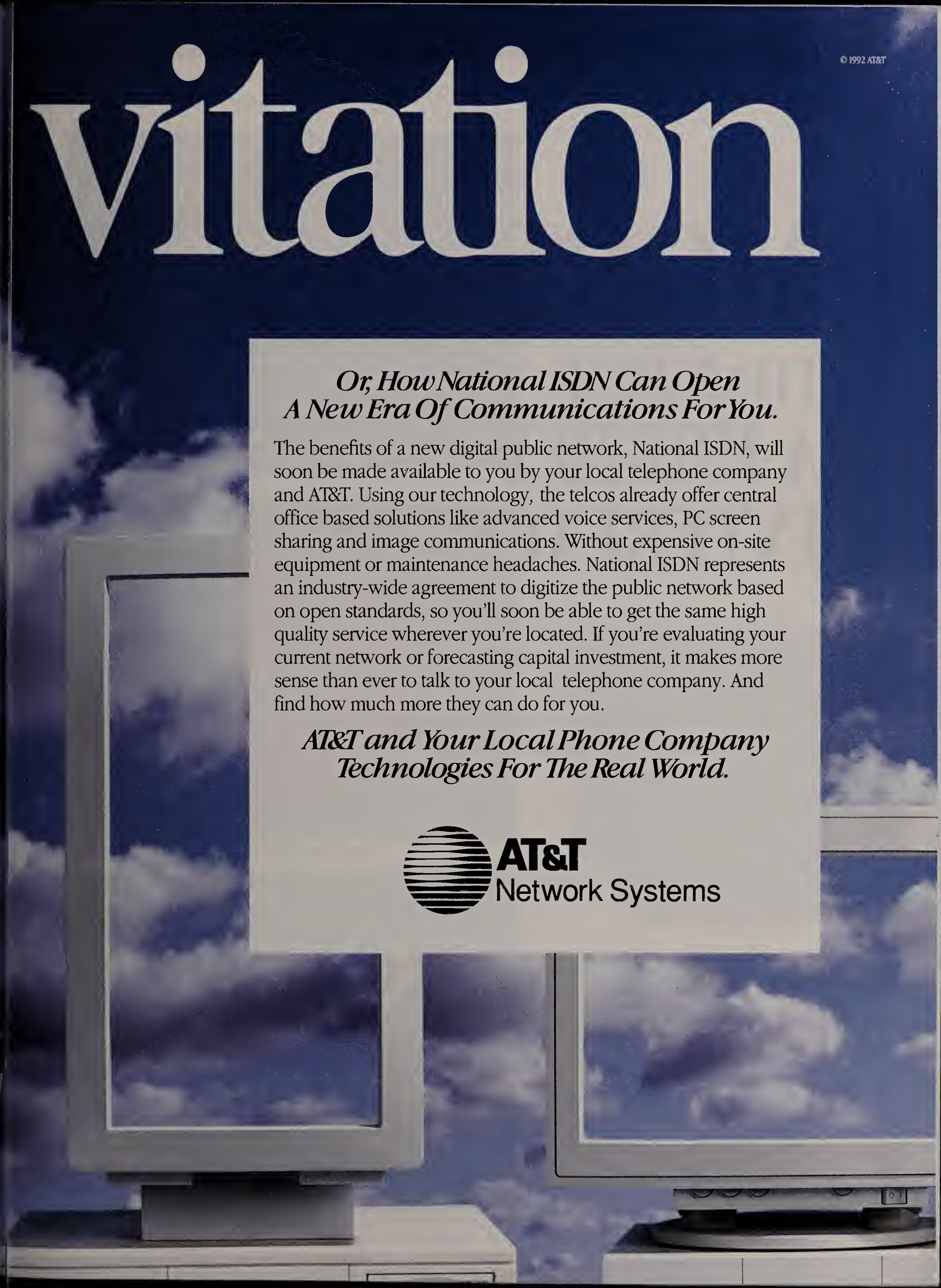
Data General AViiON Systems.
That's where the world is going.
And we want to take you with us.
Call **1-800-DATA GEN**

Data General
Where the World is going!

The AViiON System. Mainframe power that fits in a pizza box and saves you millions!

© 1992 Data General Corporation
AViiON is a registered trademark of Data General Corporation

Open In
AT&T
ISDN 8503T
Volume
Message
Mute
Redial
Program
Memory
1
ABC 2
DEF 3
GHI 4
JKL 5
MNO 6
PQRS
TUV
WXYZ



© 1992 AT&T

vitation

Or, How National ISDN Can Open A New Era Of Communications For You.

The benefits of a new digital public network, National ISDN, will soon be made available to you by your local telephone company and AT&T. Using our technology, the telcos already offer central office based solutions like advanced voice services, PC screen sharing and image communications. Without expensive on-site equipment or maintenance headaches. National ISDN represents an industry-wide agreement to digitize the public network based on open standards, so you'll soon be able to get the same high quality service wherever you're located. If you're evaluating your current network or forecasting capital investment, it makes more sense than ever to talk to your local telephone company. And find how much more they can do for you.

AT&T and Your Local Phone Company Technologies For The Real World.

AT&T
Network Systems

MORE THAN JUST A PRETTY INTERFACE

A good graphical user interface may provide the most effective means to order and control increasingly complex volumes of data. In doing so, it makes users significantly more productive.

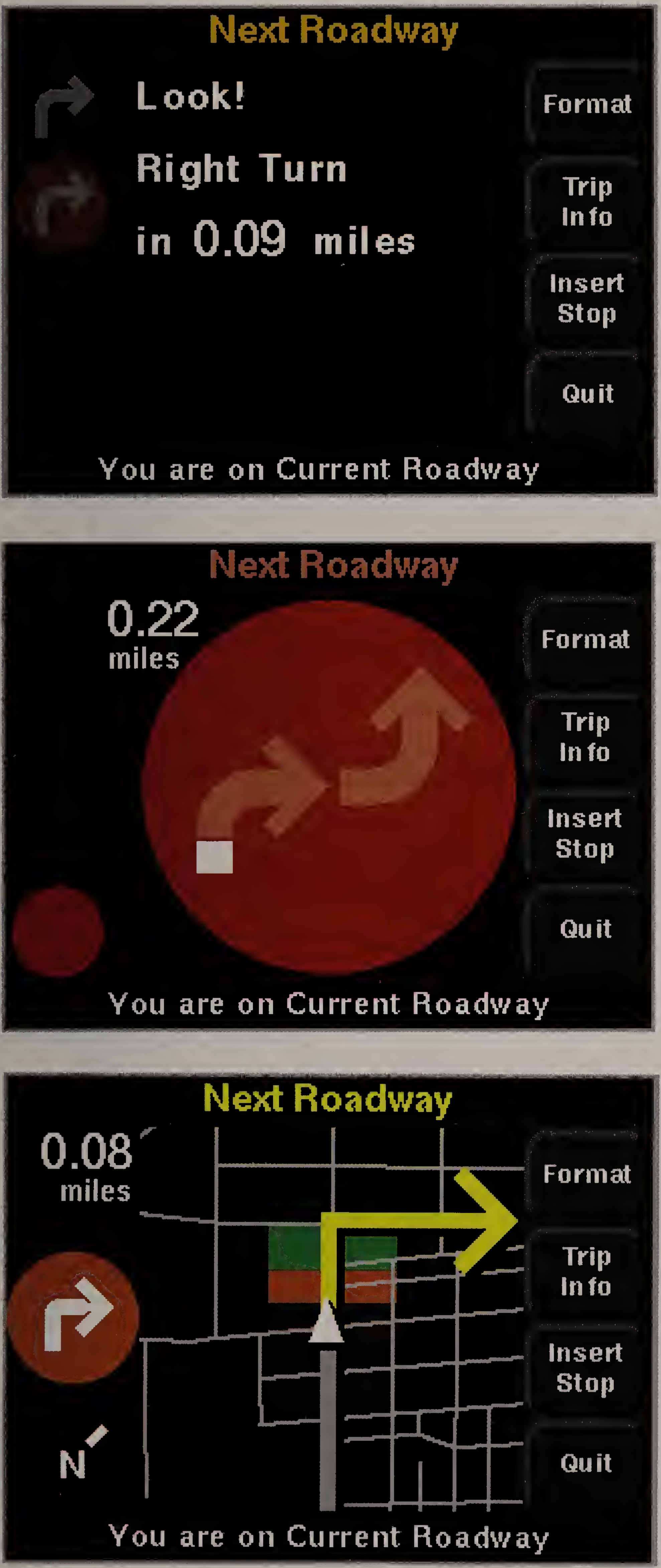
BY MICKEY WILLIAMSON

People who can read don't need a graphical user interface, say the skeptics. Experienced computer users will only be hampered by an extra layer of interface between themselves and the work they are trying to do, doubters add.

Not so, says Mercer Management Consulting Inc. (née Temple, Barker & Sloane), based in Lexington, Mass. In a 1990 study commissioned by Microsoft and Groupe Bull, the firm found that both novice and experienced microcomputer users worked faster and made fewer mistakes with a graphical user interface (GUI, pronounced "gooey") than those equipped only with a text-based user interface (TUI).

The GUI effect was even more pronounced with experienced than with inexperienced workers. Combining speed with accuracy to measure productivity, the study found that novices were 48 percent more productive with the GUI, while experienced GUI users were 58 percent more productive. One reason for this increase in productivity may have to do with the amount of information that a GUI screen can convey, compared with the older, conventional terminal display, according to Jared Spool, founding principal of User Interface Engineering, a consulting firm in Andover, Mass.

Text displays typically have space for 24 lines of 80 characters each, or 1,920 pieces of information. A graphical user interface turns every dot on the screen into a potentially distinct bearer of information. On a typical 1,024-by-768-pixel VGA dis-



Next Roadway

Look!

Right Turn

in 0.09 miles

You are on Current Roadway

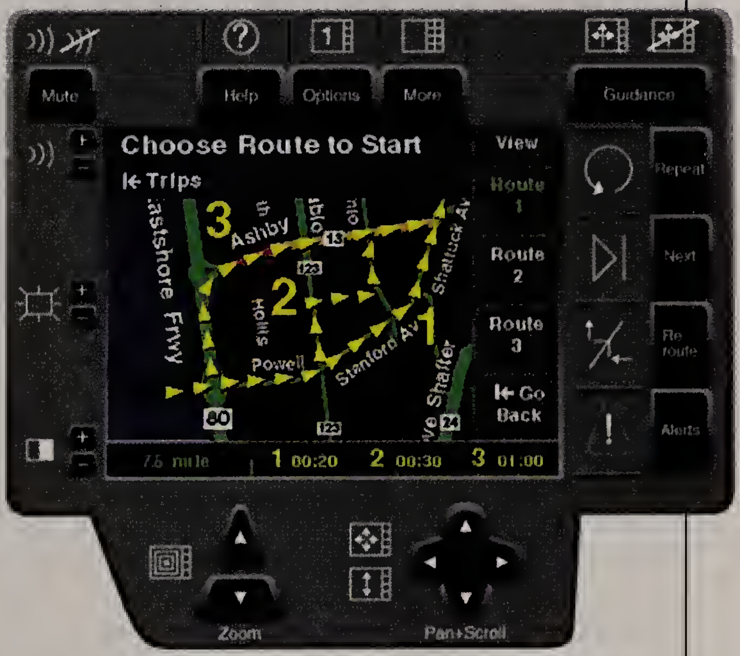
Next Roadway

You are on Current Roadway

Next Roadway

You are on Current Roadway

Left: Three ways to say the same thing. People differ in the ease with which they can interpret instructions. In designing a route guidance system for Motorola Corp. (such systems are currently being tested in the Chicago area and in Orlando, Fla.), Aaron Marcus and Associates proposed three alternate displays. One features conventional written directions, the second offers simple graphic symbols, and the third superimposes directional arrows upon a map of the area.



Choose Route to Start

Above: The system's hard-button layout takes into account a variety of user interface design issues, including the shape, location and functional groupings of buttons; the ease and speed with which they can be accessed; and the physical comfort of users.

SCREEN SHOTS COURTESY AARON MARCUS AND ASSOCIATES

Choosing the Right Tool

One way to develop GUI applications, or to add graphical interfaces to existing text-based software, is to write the code by hand—pages and pages of the stuff, which must then be linked, compiled, debugged and tested. But there's an easier way.

GUI development tools incorporate the building blocks of GUI screens. Called widgets, these components let the developer put pop-up menus, dialogue boxes and all the rest of the graphic panoply in place without having to worry about the proper syntax for creating them. Typically, what remains for the developer is to add the programming behind the interface.

Making sense of the multitude of GUI tools can be a daunting task. Here are some ways to approach tool selection.

- **Pick the application's target hardware and operating system, then decide whether to develop for that environment's GUI standard or break new ground. If an application is intended to stand alone, standards are unimportant. But if it is meant to work with other applications, working conventions make it easier to learn and use.**
- **Determine how many people will be involved in developing the GUI. Most GUI tools are single-user affairs, some support small work groups, and a few support large teams and multiple related projects.**
- **Decide which is more important: flexibility or development speed. The more flexible the tool, the more it will challenge the developers who use it.**
- **Look for hidden costs. Some products need other products—such as languages, screen painters, code generators and compilers—to make them work. Some vendors sell run-time licenses separately, or charge royalties for distributed applications.**

– M. Williamson

play, that means more than 780,000 bits of visual data. Add color and the potential is even greater, Spool pointed out. With judicious use of this capacity to convey information, even speed readers can benefit from a graphical user interface.

They may be attractive, and even fun to use, but GUIs are not toys. A GUI is a medium for communication—direct, effective communication—between human beings and computers, said Aaron Marcus, founder and principal of Aaron Marcus and Associates, a graphic-design consulting company in Emeryville, Calif. GUIs may be colorful, they may even at times display a sense of humor, but they are serious business. Their design, Marcus said, merits as much care and attention as the underlying applications.

Well-designed GUI-based applications are easier to learn and use, according to Marcus; they also in time become easier to produce. Purists might quibble with this assertion, but GUIs are by nature object-oriented. This means, among other things, that they are modular in design, made of reusable parts and, for many purposes, a sound investment.

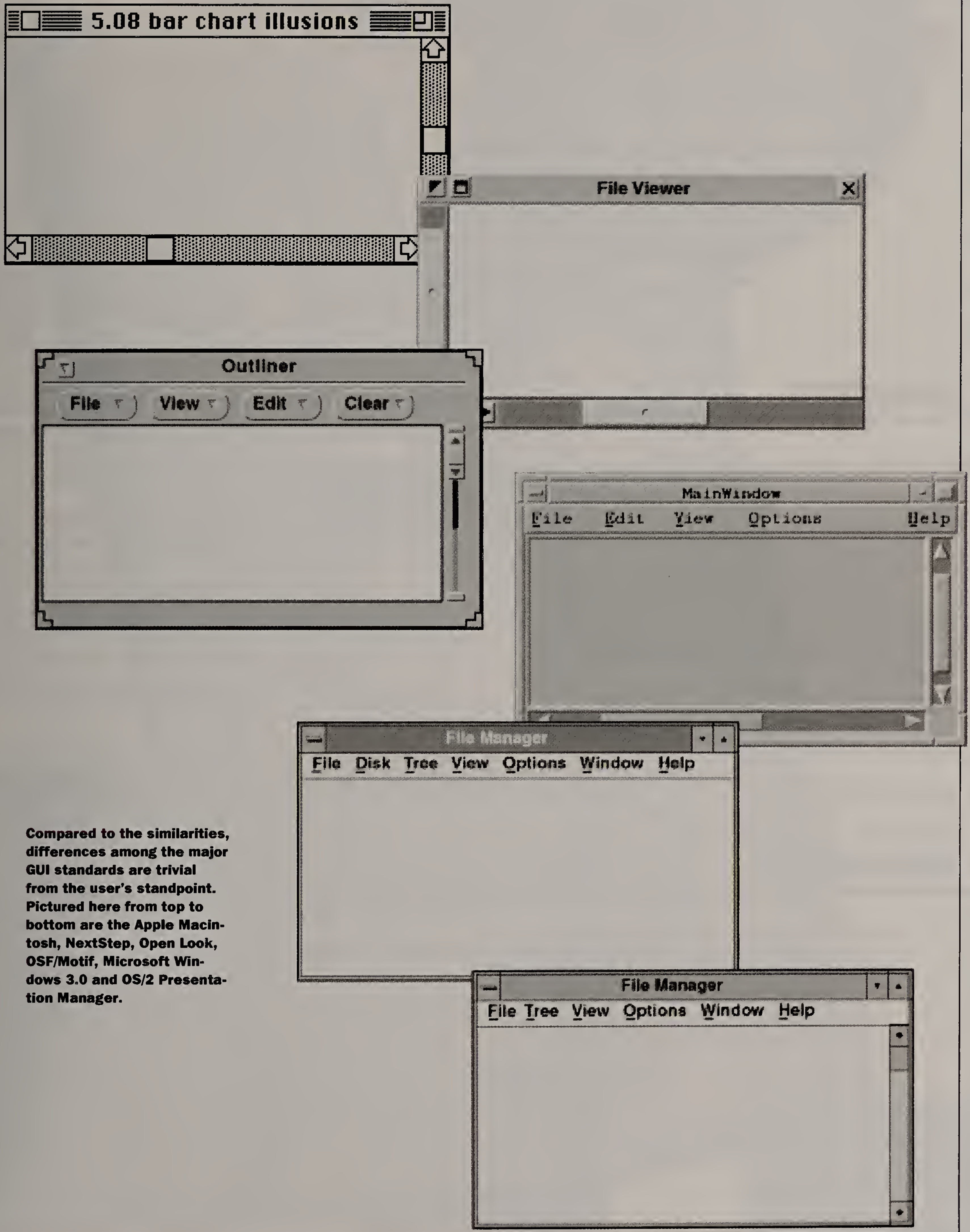
This is not to say that putting graphical interfaces on applications will save money in the next quarter. Quite the opposite, Marcus noted. GUI developers get to spend a lot of time writing code that has little to do with the underlying application. For example, he said, the first program every C programmer learns to write takes two lines of code to print the words "Hello world" on the terminal screen. To do the same thing in almost any graphic environment requires some four pages of code, he said, because there is much more going on than simply putting a few letters on the screen. According to Marcus, in the typical GUI application the user interface accounts for about half the programming. "You can write thousands of lines of code just to make the screen look the way you want it to," he explained.

"Just to match the functionality you had in your previous application takes almost an order of magnitude more work," Spool agreed. "People don't realize that when they get into it, and they don't allocate the proper resources."

It's no wonder that IS executives find it difficult to convince their upper management to invest in GUI development, Marcus said. People have done without them for generations. But needs change. Being able to manage ever-increasing volumes of data requires more applications and more capability in each application.

"In a way it's a confirmation of the CIO's role," Marcus said. "You cannot just ship all this pure technology and assume it will be understood and used correctly. It's never like that with human beings. We must devote a significant amount of time and money to wrap a user interface around functions and data so that our workers can take advantage of these powerful [applications]."

Not everyone needs a GUI, to be sure. "I came from a very technical background," said Stefan Kent, manager of marketing and sales at Gpf Systems Inc., a software company in Moodus, Conn. "The first time I was forced to deal with a GUI, I found it in my way. I knew what I


5.08 bar chart illusions
File Viewer
Outliner
File View Edit Clear
MainWindow
File Edit View Options Help
File Manager
File Disk Tree View Options Window Help
File Manager
File Tree View Options Window Help

Compared to the similarities, differences among the major GUI standards are trivial from the user's standpoint. Pictured here from top to bottom are the Apple Macintosh, NextStep, Open Look, OSF/Motif, Microsoft Windows 3.0 and OS/2 Presentation Manager.

wanted to do, and I could type in the command and get things done without having to work my way through several different menus or layers. I thought they were very clumsy and that I'd never get used to working in that environment."

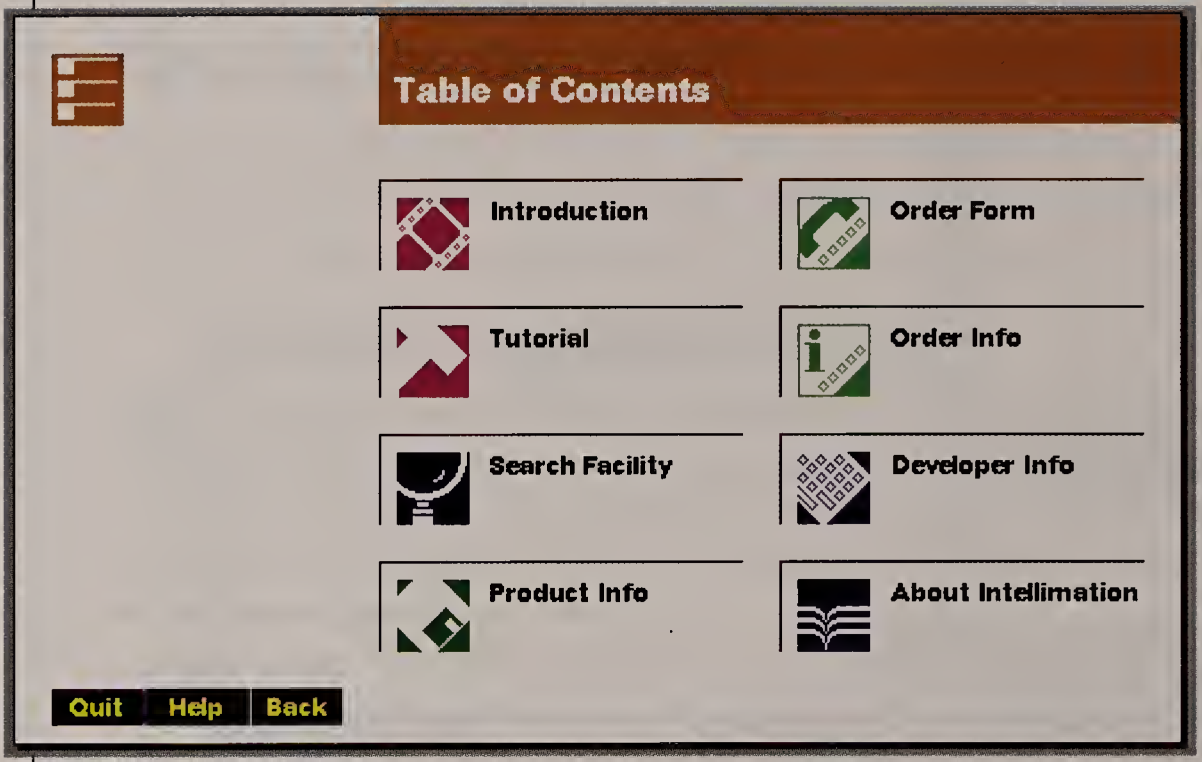
Kent changed his mind when he discovered that his first experience had been with a poorly wrought interface. The designer had brought to the GUI world some text-based design rules concerning the number of choices that should be offered on a single menu. Because GUIs can convey information so much more economically, many more options can be displayed at one time, making it easier for users to know what to do and to keep track of where they are in the system, Kent said.

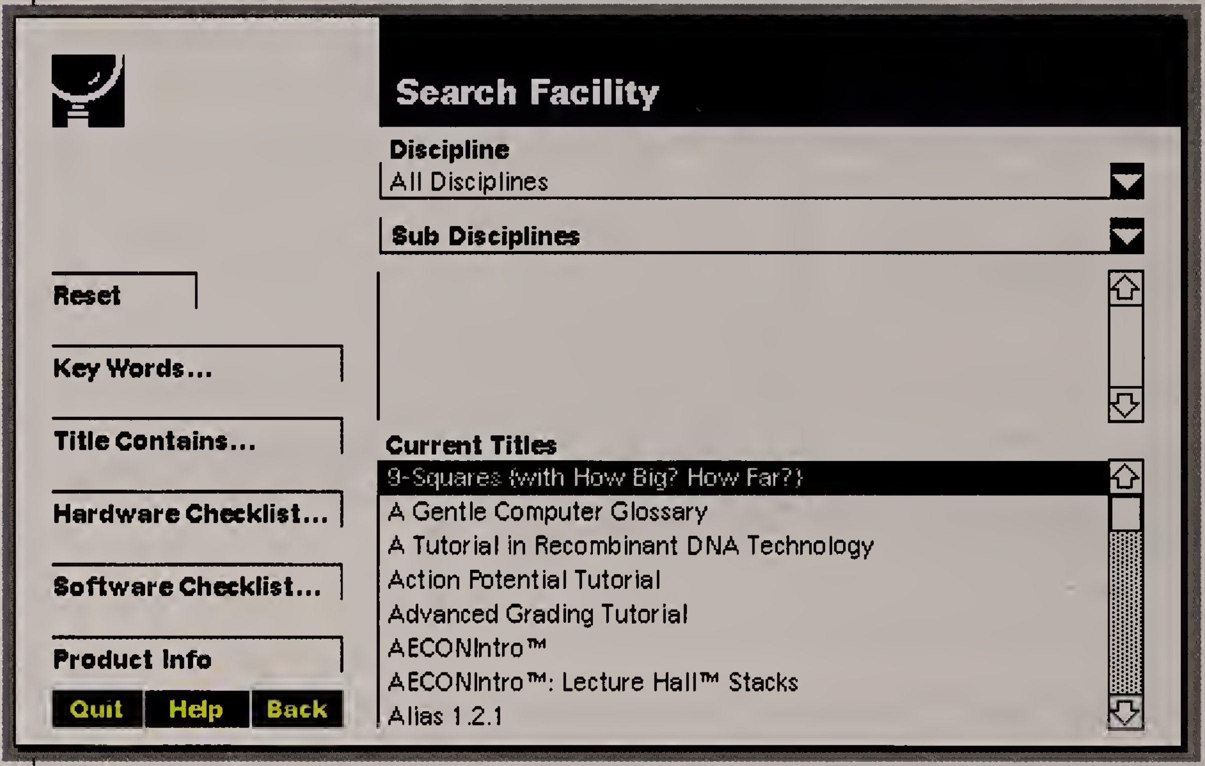
Incorporating GUI design into application development has profound implications for the entire process. Forget the classic waterfall life cycle, in which one phase (analysis, design or coding, for example) is completed before the product is promoted to the next one. GUI design is properly an iterative process, Kent said.

"You need to find out how the users perceive what the machine is doing for them and what would make it easier," he explained. "Then it's necessary to do a reasonably thorough and functional prototype of the application. But before you complete it you should have the users play with it. That's the only way to spot the weaknesses."

Users can't always articulate their own needs, Spool observed, "which means you may have to go in and observe them yourself. I have clients who actually go out and do their customers' jobs for a couple of days every quarter. When you send developers out to become operators on the graveyard shift of directory assistance, they come back with a wealth of information that allows them to build products that are not just 5 to 10 percent better than the existing products, but 100 percent better."

Designers should recognize that where GUIs are concerned, one size





Discipline: All Disciplines

Sub Disciplines

Current Titles

9-Squares (with How Big? How Far?)
A Gentle Computer Glossary
A Tutorial in Recombinant DNA Technology
Action Potential Tutorial
Advanced Grading Tutorial
AECONIntro™
AECONIntro™: Lecture Hall™ Stacks
Alias 1.2.1

Top: In designing the catalog of a CD-ROM library for Intellimation, Aaron Marcus and Associates strove for a clean, uncluttered look. Borrowing the familiar metaphor of print, this menu screen is labeled Table of Contents. Text labels are linked with graphical icons that will be repeated in the upper left corner of the display selected by the user.

Bottom: Having chosen the Search Facility from the Table of Contents, the user can inspect checklists of required hardware and software. The aim here was to use as few pixels as possible. Thus, the left and bottom edges of menu options at left complete the frame. Wherever possible, lines are one pixel wide.

"AN ARCHITECTURE OF POSSIBILITIES IS ROOTED IN THE CONSTANT OF CHANGE."

Richard Rogers,
Architect

The architects of software confront the same challenge as the architects of steel and glass: the constant of change.

Changes in business. And changes in technology.

There is one software architecture designed to deal with the constant of change: Sybase.

Sybase gives you the flexibility to create applications that integrate data sources of every kind—databases, multimedia, real-time sources, even mainframe applications—into a high performance client/server computing environment. The flexibility to modify those applications quickly as your business and computing environment changes. And the flexibility to run those applications on the hardware of your choice: PCs, workstations, minicomputers, mainframes.

This flexibility makes Sybase the most effective technology for building today's on-line enterprise. And gives you a unique ability to adapt to the needs of tomorrow.

Sybase. Client/server architecture for the on-line enterprise.

To find out more about our database, application development and connectivity products, and our multivendor consulting services, please call 1-800-8-SYBASE.

©1992 Sybase, Inc.

The Lloyds Building, London. Designed by Richard Rogers. A loose, changeable framework, constructed with components which can easily be adapted, removed, or reconfigured as business needs change.

SYBASE®

CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

doesn't fit all, Marcus pointed out. Individuals vary greatly with respect to culture, cognitive style, physical characteristics and aesthetic preference; even a single individual's performance will vary over time. "GUIs don't respond to the time of day and your alertness," Marcus said. "They don't recognize your name and say, 'You're over 40; I'll enlarge the type so you can see it better,' but they could. It's trivial computer science, but it's humane communication."

Even designers dedicated to GUI excellence can fall short of the mark. Spool, an avid proponent of having developers observe users as they test the software, once watched the chairman of a giant consumer-products company struggle with a prototype GUI that was being designed for a course at Harvard Business School "for people just like him," Spool stressed. "This man, the head of a $600 million company, turned to me in the middle of the test and said, 'I'm sorry for being so stupid about this. You've really got the wrong guy. You should have picked someone smarter.'

"That's what happens in the real world with badly designed software," Spool continued. "When people are made to feel stupid by the product, they don't call the help desk and say, 'I'm really too dumb to figure out this application; can you explain it to me?' That's what a poorly designed piece of software will do to you. It will make you feel stupid."

It's no surprise, therefore, that the pressure for conventions in user interface design is considerable. Some universal standards exist today. Regardless of the platform, menus are arrayed across the top of the screen, and selecting an option causes a submenu to drop down on the screen and display additional choices. Applications appear in windows whose sizes can be changed. Windows can be moved around the screen and overlapped or tiled—that is, automatically arranged so as to fill completely the available display space. Dialogue boxes provide options not available in menus; query boxes pop up in response to user actions and await additional information. Scroll bars appear at the bottom and to the right of windows containing information not immediately visible. Small symbols at the tops of windows are used to maximize and minimize their size, and to close them entirely.

Compared to these similarities, differences among the major GUI standards are trivial from the user's standpoint. The choice of GUI is more often determined by the standard for a particular hardware and operating system configuration.

In his book *Graphic Design for Electronic Documents and User Interfaces*, Marcus dissects and compares the six major GUI standards.

- **Apple Macintosh:** The oldest of the GUIs, it has always supported an interaction style featuring direct manipulation of graphical objects, such as the ability to drag an icon representing a disk file from one directory to another. Even today, eight years after its introduction, other GUIs are judged against it.
- **NextStep:** Like the Macintosh GUI, NextStep's human interface is tied to a single processor and is oriented toward the nontechnical user. NextStep was the first to adopt a

The Principles of GUI Design

Good GUI design takes into account five fundamental concepts, according to Aaron Marcus, head of Aaron Marcus and Associates, a graphic-design consulting company in Emeryville, Calif.

Metaphor: the fundamental image or concept associated with the GUI and its applications. Windows, the name of Microsoft's GUI, is also that product's metaphor. (Other companies have adopted the windows metaphor as well.)

Cognitive, or mental, model: the appropriate and task-oriented organization of data, functions, tools, roles and people. Grouping applications to perform tasks such as desktop publishing or telecommunications, for example, reflects the fact that a person can have various roles in an organization. It also sets the stage for cooperative work, workflow improvements and increased productivity, Marcus said. This differs from the system's functional specification, which is a checklist of all the features a product should have but says nothing about how they should be organized for the benefit of the user.

Navigation: how people move around in the mental model. This is the realm of menus, dialogue boxes and control panels; these should make things appear simple in order to avoid confusing and overwhelming the user.

Appearance characteristics: the "look" of "look and feel." The more familiar the look as the user moves among applications, the easier the applications will be to learn and use. Aesthetics is an important issue, and graphic designers have an important role to play here.

Interaction techniques: the "feel," concerned with what happens when the user presses a particular key, and the sequence of events when applications run. For example, when UPS set out to build a GUI for data-entry operators, management considered it of prime importance that the tab-key conventions to which operators were accustomed not be altered. In a poorly planned project, issues such as this may not surface until the application is delivered.

–M. Williamson

YES! SEND ME INFO ON EIS II.

Send me a free Information Kit on EIS II — the new generation of Executive Information Systems from Information Resources.

Return this coupon today or call us directly at
1-800-765-7227
(416-221-2100 in Canada).

Or FAX this card to
617-890-4660

information resources inc
SOFTWARE PRODUCTS GROUP

Name ______________________

Title ______________________

Company ______________________

Address ______________________

City/State/Zip ______________________

Telephone ______________________

What is your involvement in selecting an EIS for your organization?

- ☐ Evaluate/recommend
- ☐ Approve/authorize
- ☐ End-user

© 1992

CIO

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 48046 WALTHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

information
resources inc
SOFTWARE PRODUCTS GROUP
Marketing Department
Attn: D. Rooney
200 Fifth Avenue
Waltham, MA 02154

EIS II:

THE FIRST ENTERPRISE-WIDE SOLUTION.

Open systems, client-server computing and workgroups. These are the new definitions for enterprise-wide corporate computing. And EIS II is the software solution:

- **Integrated applications.** Departmental solutions for sales, marketing and finance support rapid prototyping, applications distribution and bottom-line results.
- **Easy-to-use power.** EIS simplicity through an easy-to-use GUI coupled with true data-driven analytical power for executives, managers and analysts.
- **One unified architecture.** Client-server versatility open to major hardware platforms and operating systems - on stand-alone PC, LAN, mini or mainframe.
- **The bottom line.** Better information enterprise-wide, the tools to use it more profitably and lower support costs. That's why EIS II is the fastest-growing corporate computing solution.

Call **1-800-765-7227** for a free EIS II Information Kit (**416-221-2100** in Canada).

information resources inc

SOFTWARE PRODUCTS GROUP

©1992 Information Resources,Inc., Software Products Group, 200 Fifth Avenue, Waltham, MA 02154

simulated three-dimensional appearance, and its genius lies in shielding the user from the complexity of the Unix operating system.

- **Open Look:** Developed jointly by Sun Microsystems and AT&T, this is the standard operating system for Unix System V.4. An important goal of Open Look's developers was to avoid "look and feel" suits, so many of its conventions deviate significantly from those of the other GUIs.
- **OSF/Motif:** Like Open Look, Motif is layered atop the X Window System developed at MIT. Motif, aimed at high-end networked workstations, was developed by Digital Equipment Corp. and Hewlett-Packard for the Open Software Foundation. Its appearance and behavior are based on those of OS/2 Presentation Manager (below). PC users familiar with that system or with Microsoft Windows will find it easy to adapt to Motif on a Unix workstation.
- **Microsoft Windows and OS/2 Presentation Manager:** In appearance and behavior the two are quite similar, which is no surprise since Microsoft developed both of them—the latter in cooperation with IBM. Windows runs under MS-DOS, Presentation Manager under OS/2; as competition between those two operating systems heats up, it is reasonable to expect the two GUIs to diverge. Currently, Windows is the more popular among end users; OS/2 PM is used more by developers. OS/2 PM makes significantly more demands on user memory and disk storage, a fact that may drive the choice in some organizations.

The quest for humane communication is what graphical user interfaces are all about. A good GUI is pleasant to look at; it communicates as much information as needed—and not a bit more—without confusing the user. As it turns out, and as the Mercer Management Consulting study has demonstrated, humane communication is also good business. CIO

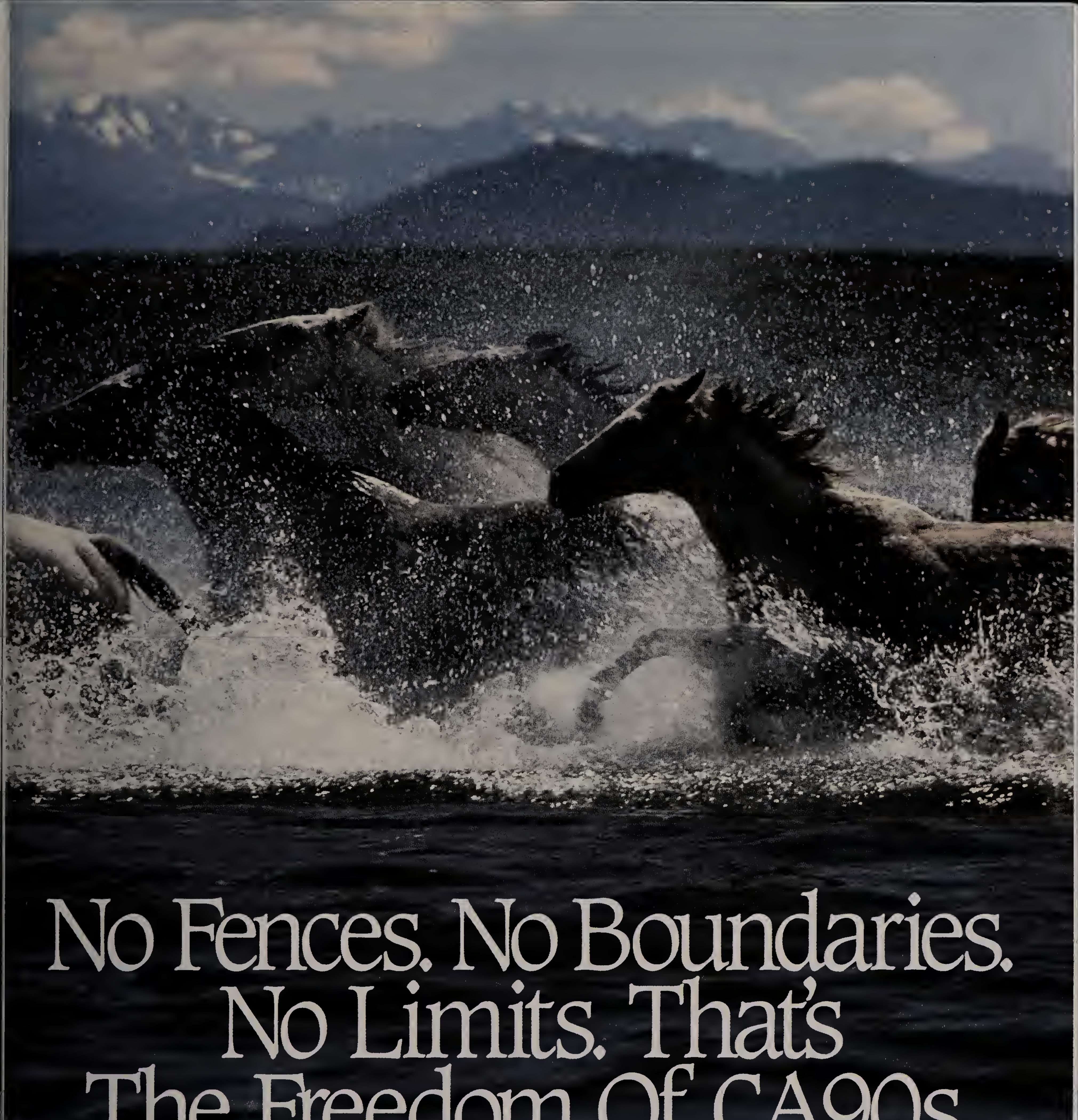
Mickey Williamson is a technical journalist in Warwick, Mass., who specializes in emerging technologies. She edits the newsletter "CASE Strategies."

Market Watch: GUI Development Tools

There are well over 100 products being marketed as GUI development tools. The following are some of the better-known.

COMPANY & LOCATION	PRODUCT
Asymetrix Corp. Bellevue, Wash. 800 624-8999, ext. 299; 206 637-1500	**ToolBook:** object-oriented, 4GL-like program for developing applications for Windows
Easel Corp. Burlington, Mass. 617 221-2100	**EASEL:** a tool for building GUI front ends for existing mainframe databases or applications, or for developing new, highly graphical applications in cooperative-processing modes
Guidance Technologies Inc. Pittsburgh 412 231-1300	**Choreographer:** OS/2 Presentation Manager application interface that includes a library of SAA/CUA-compliant components and development tools
Gpf Systems Inc. Moodus, Conn. 800 831-0017; 203 873-3300	**GPF:** a tool for developing front ends for OS/2 and Windows
Gupta Technologies Inc. Menlo Park, Calif. 800 876-3267; 415 321-9500	**SQL Windows:** application-development system that couples Windows with SQL
IXI Ltd. Cambridge, Mass. 617 494-6514	**Deskterm:** a software tool that allows existing character-based software written in Fortran, Cobol, 4GL or C to run in the X environment with a Motif-style front end
Integrated Computer Solutions Inc. Cambridge, Mass. 617 621-0060	**Builder Xcessory:** a Motif toolkit for developers who are not familiar with the details of the X Window System and Motif
Knowledge Garden Inc. Setauket, N.Y. 516 246-5400	**KnowledgePro Windows:** an expert development system for Windows applications
Microsoft Corp. Redmond, Wash. 800 426-9400; 206 882-8080	**Windows Software Development Kit (SDK):** Microsoft's own development tool
Neuron Data Palo Alto, Calif. 415 321-4488	**Neuron Data Open Interface:** GUI development tool that allows portability across standard windowing environments
NeXT Inc. Redwood City, Calif. 415 366-0900	**NeXTstep:** the GUI and associated development environment bundled with NeXT computers; licensed by IBM, whose RISC System/6000 workstation family will support it
SunSoft Inc. Mountain View, Calif. 800 227-9227; 415 336-4252	**OpenWindows Developer's Guide:** an interactive tool that enables developers to design the 3-D Open Look GUI for their applications
TeleSoft San Diego 619 457-2700	**TeleUSE:** an object-oriented user interface management system for Motif
Tigre Objects Systems Inc. Santa Cruz, Calif. 408 427-4900	**Tigre Programming Environment:** a universal GUI builder that simplifies the porting of GUIs among Windows, the Macintosh and Unix-based Motif and Open Look

SOURCE: JON PEDDIE, AUTHOR OF *GRAPHICAL USER INTERFACES AND GRAPHIC STANDARDS* (MCGRAW-HILL) AND PUBLISHER OF THE MARKET NEWSLETTER "THE PC GRAPHICS REPORT."



No Fences. No Boundaries. No Limits. That's The Freedom Of CA90s.

The freedom to choose the best applications without worrying about hardware constraints.

The freedom to right-size your entire computing environment with the best mix of hardware platforms.

And the freedom to integrate and automate all your applications across the many proprietary, closed environments you face today. It's all there inside the most comprehensive architecture ever developed: CA90s.

The only architecture that supports every major hardware platform including IBM, Digital, Hewlett-Packard, Apple, Fujitsu, Bull, Data General, Tandem and Hitachi. All the major operating systems: MVS, VSE, VM, VMS, UNIX, APPLE, WINDOWS, DOS and OS/2.

And the world's broadest range of integrated software solutions, covering systems management, information management and business applications.

If you're tired of being fenced in, call 1-800-CALL CAI for complete information on CA90s.

The architecture that can set you free.

COMPUTER® ASSOCIATES
Software superior by design.

©Computer Associates International, Inc. One Computer Associates Plaza, Islandia, NY 11788-7000. All product names referenced herein are trademarks of their respective companies.

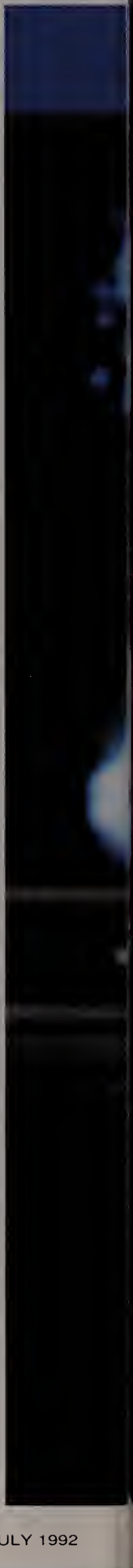
The American Association of Retired Persons combines young technologies and seasoned volunteers to create a potent political force

MATURE TECHNOLOGY

BY MEGHAN O'LEARY

George Bernard Shaw was right: youth *is* wasted on the young. Just look at the American Association of Retired Persons—one of the most dynamic, aggressive and influential membership organizations in the country—and composed entirely of people over 50. With an enormous volunteer base empowered by technology, AARP has emerged as both a potent political force and an unusually effective service provider. Interested parties on both sides of senior-sensitive issues will attest that AARP is anything but retiring.

AARP, which is non-profit and non-partisan, is reputed to be the largest membership organization in the country. It has 4,000 chapters and 34 million members, including 400,000 very active volunteers. (Its predominantly young staff of 1,200 is small, by comparison.) But AARP's strength isn't just in numbers. The group is an organizational and technical powerhouse: Its ability to deliver services ranging from safe-driving education to bereavement counseling has won it both loyalty and respect.



STEVEN R. CABLK: *moving resources and decision-making power out to the field*

PHOTO BY KATHERINE LAMBERT

The IEF™ works. For Aetna
For Rhône-Poulenc Rorer

The success of Texas Instruments I-CASE product is proven—in the field.

There is an integrated CASE product that works. It works now...and it works well.

The IEF™, or Information Engineering Facility™, is in use now by successful companies, large and small, all over the world.

Major gains in productivity, quality, and maintainability.

Productivity gains in initial development are hard to measure, but reports of 2-to-1 improvements are fairly common—and some go as high as 5-to-1.

Quality improvements are dramatic. Users are getting more of what they need to run their businesses. Systems get up and running easier and faster.

As for maintenance, a Gartner Group study showed that, even back in 1990, more than 80% of IEF developers were getting gains of from 2-to-1 to 10-to-1.

Now, develop on PC and generate for DEC/VMS, UNIX. TANDEM, WINDOWS available soon.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC and CICS) since early 1988. Now you can develop systems in OS/2 and automatically generate for DEC/VMS and some UNIX platforms. TANDEM, Microsoft® WINDOWS, and more UNIX will be available soon.

Developers give IEF highest rating in COMPUTERWORLD.

COMPUTERWORLD magazine's "buyer's scorecard" showed that developers ranked the IEF first among all I-CASE products in the study, particularly in the areas of application quality, programmer productivity, and value for the dollar.

New tutorial provides very fast, friendly IEF training.

We believe our new Rapid Development Tutorial is a breakthrough in CASE training. We gave it the broadest possible beta test—more than 100 companies participated. Developers were able to learn to build systems with the IEF more quickly than ever before—some in as few as five days!

Special "Starter Kit" offer combines new tutorial and full-capability PC toolsets.

The new IEF Starter Kit will give you everything you need to start building systems with I-CASE on your OS/2 PC.

Along with the tutorial, the kit includes our standard OS/2 PC analysis, design and construction toolsets as well as testing and code generation in C. (A COBOL compiler is optional and priced separately.)

There's also 90 days of "hot-line" support.

The kit is priced at $10,000 (limit one per customer company). That's about one-half the regular cost of the toolsets.

If you're not convinced that the IEF can work for you, here's a chance to see for yourself—at a special low price and (with the new tutorial) in a very short time.

To order an IEF Starter Kit, or for more information, call 800-527-3500.

TEXAS INSTRUMENTS

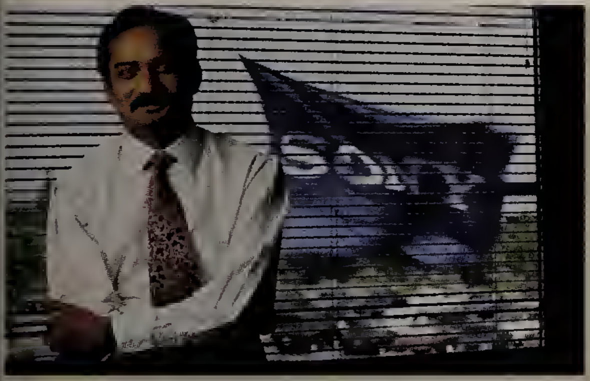
© 1992 TI.
Information Engineering Facility and IEF are trademarks of Texas Instruments.
Other product names listed are the trademarks of the companies indicated.
230015-R

Target. Rolls-Royce. Canadian Airlines. Sony.

"Our first major project was a mission-critical system for our Managed Care operation. Conventional development would have taken 2-3 years...with the IEF, we built the first release in only 13 months. The IEF is now our company CASE standard."
Richard F. Connell
VP, Information Technology
AETNA

"MERLIN is mission-critical—the most far-reaching business systems initiative we've ever undertaken. Over 400 transactions are in production, with 800 more to be added in the next three months. We could not handle this scale and complexity without IE/IEF."
Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce Aerospace

"With previous methods, we would have had to compromise on an 'okay' 10-screen Lease Accounting system. With the IEF, our users got everything they wanted—an outstanding 40-screen system—in the same time. They are requesting the IEF for all future systems."
Tom Jeffery
Sr. VP, Information Systems
Target



"The IEF offers dramatic improvements in productivity, yet it's easy to learn. One example: We trained 23 developers, including 18 new hires, and then completed a large order processing system—300 transactions —all in only 20 months."
Venkat (Vinnie) Tiruviluamala
Director, CPC/CPPC Information Systems
SONY Corporation

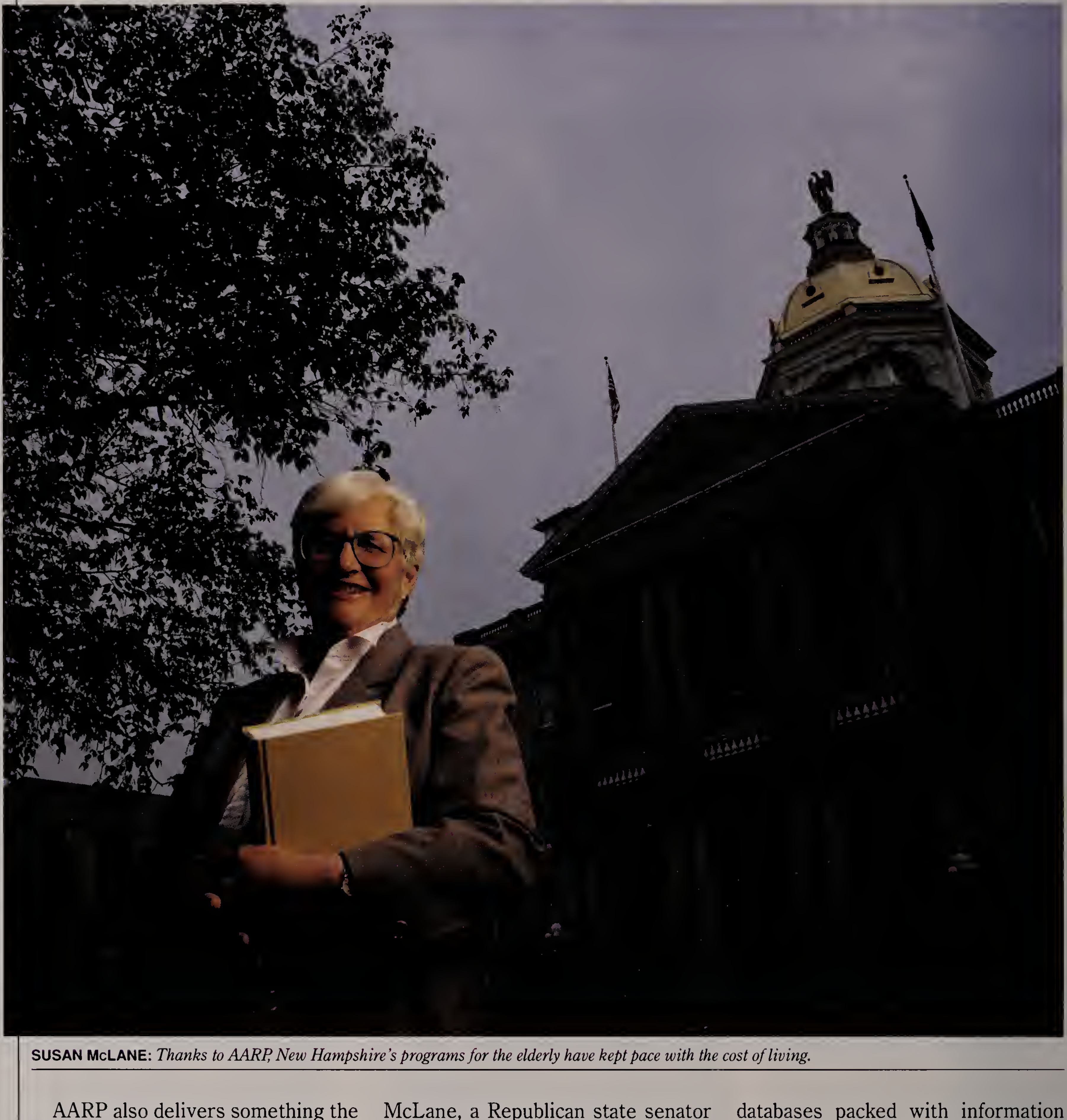
"We used an IEF frequent flyer template to build our 'Canadian Plus' system. A major redesign, estimated at 4-6 months using previous methods, took less than a month. Now we're providing better customer service, and maintenance costs are greatly reduced."
Bill Palm
President, Canadian Technology Services
Canadian Airlines

"Our new Customer Order Services Marketing Information System—over 500 transactions and 250 entities—is in production. Quality is excellent and our users are very pleased. Dedicated people armed with the IEF advantage have made COSMIS a success."
James R. Engle
Director, Systems and Programming
Rhône-Poulenc Rorer

"Your new IEF tutorial was a way to quickly become familiar with the IEF and see how the IEF will allow quality systems to be built very quickly. I feel I now know how to build systems using the techniques described."
Roger Strand
Application Development Consultant
First Federal Lincoln

"The IEF tutorial is very well done. I feel comfortable with this software and I have acquired the skills to build simple systems. The tutorial is a very fast and effective means of evaluating the capabilities of the IEF."
Margaret Kubaitis
Research Programmer, IS&S
University of Illinois

"The IEF tutorial is put together very well and quickly illustrates how to construct a system using the IEF. It gives one the basics to start getting the job done. I feel I am prepared now to build simple systems using the IEF."
K. E. Peacock
Data Administrator
City of Saskatoon, Saskatchewan



SUSAN McLANE: *Thanks to AARP, New Hampshire's programs for the elderly have kept pace with the cost of living.*

AARP also delivers something the elderly in America have traditionally lacked: organized legislative clout. Since its inception in 1958, the organization has steadily gained in political savvy. Today, AARP's ferocious defense of entitlement programs for the elderly is legendary, and its volunteers are famous for their zeal. "They are sophisticated about the legislative process," said Susan McLane, a Republican state senator from New Hampshire. "They know when the hearings are. They battle all the way through. They speak for a lot of people, and they make that very clear."

AARP is able to speak, and to act, for so many because of its impressive technical and human resources. A robust and growing communications network and an arsenal of databases packed with information on members, volunteers, legislators and legislation directly enlighten and educate its foot soldiers. Thus, AARP can keep volunteer lobbyists up-to-date and vocal on legislation affecting health insurance, say, or social security—and can mobilize them quickly for time-sensitive letter-writing campaigns.

McLane credits AARP for ensur-

PHOTO BY BILL TRUSLOW

The Sincerest Form of Flattery

America's baby boomers are organizing AARP-style to protect their own piece of the pie

The American Association of Boomers, based in Irving, Texas, hopes to do for the under-50 crowd what AARP has done for older citizens. "Currently, we're a friendly sleeping giant," said Sam Kopper, a volunteer director. But the 3-year-old, 30,000-member organization hopes to use AARP-style volunteer power to ensure entitlement programs for the 77 million people between the ages of 28 and 46.

AAB's concerns are not age-specific: The group considers itself the last, best hope for the environment, the economy and education. But like AARP, it has touched off considerable controversy, in AAB's case by challenging the mother of all entitlements. Social Security has been called "America's political third rail" by author Dorcas Hardy—you touch it and you die.

"Our society tends only to look a quarter, a contract or an election ahead," said Kopper, and AAB believes the government's Social Security policy exemplifies such shortsightedness. The organization charges the Social Security Administration with misleading the public by calling Social Security a trust fund when, in fact, payments go into "special issues of the Treasury" that have no marketable value and are used to pay current entitlements and government debts. At this rate, according to Kopper, coming generations will have to spend at least 40 percent of their incomes just keeping the system afloat.

AAB says it wants a cooperative, intergenerational dialogue about the nation's future. But by going after Social Security with suggestions of means testing and privatization, the organization is essentially threatening to butcher one of AARP's sacred cows. Executive Director Karen Meredith is not daunted by the size of her opponent, however. While AAB has yet to prove its lobbying mettle, she emphasized that its potential influence is substantial. "A lot of people in Washington are very worried about what we're doing."

–M. O'Leary

---

ing that, despite the recession, New Hampshire's programs for the elderly have kept pace with the cost of living. "Due to AARP, the elderly have gotten their share," she said.

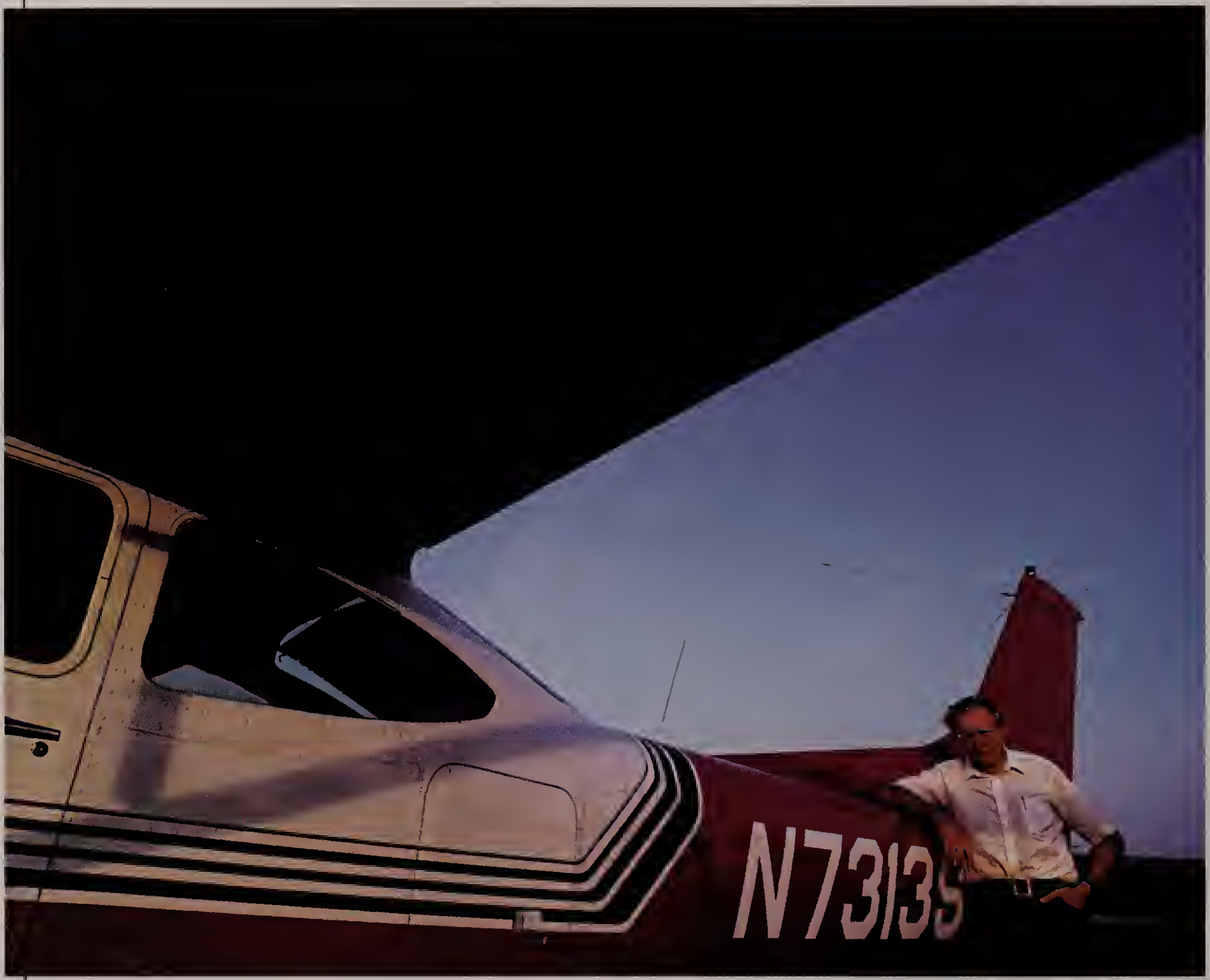
AARP's record of legislative wins has raised some ire among those who represent other special interests competing for scarce resources. Funding for children in welfare families has declined, for example, and even an AARP supporter like McLane believes that this may be an unfortunate byproduct of the group's legislative victories. Welfare mothers in New Hampshire don't know what a legislative hearing looks like, according to McLane. And many don't vote, something AARP members do faithfully.

Nor are these competing interests supported by anything as sophisticated as AARP's technical hub in Washington. The organization's pair of custom-built towers is just three years old and wired for sound, data, video and any other technological opportunity that might come along. Raised floors hide thousands of feet of copper and fiber cable; a still-unused satellite port pokes expectantly from the top of one tower.

AARP's ferocious defense of entitlement programs for the elderly is legendary, and its volunteers are famous for their zeal.

Headquarters staff also have access to national E-mail (AARP's "lifeblood," according to Tom Nelson, division director of field services) and to numerous private databases that include information on members' views and volunteer work, updates on legislative activity and research on issues affecting the elderly. The organization's 220-person field staff can access these databases and the E-mail system (called AARPNet) via dedicated 56K lines. (Most volunteers, however, still get their information from the field offices. Fewer than 200 can currently access AARPNet via AARP-supplied laptops—but that number is growing.)

Meanwhile, Steven R. Cablk, director of management information systems operations, is busy moving the organization's resources and decision-making power out to AARP's field offices—adding data and video communications between Washington and nationwide area offices and putting more microcomputers in the field. Cablk says he is working toward a LAN-based, client/server environment in which any authorized AARP employee or volunteer can easily access a wealth of relevant information.



A.D. COPESTAKES: *His newsletter tracks the direction legislators are leaning on upcoming legislation.*

Supplying complete, accurate and timely information to its volunteers is vital to an organization that relies heavily on grassroots lobbying activities. "Research is very important," said AARP's director of legislation and public policy, John Rother. This is especially true when entitlement programs are at issue. "Obviously, anytime you talk Medicare, you're talking big dollars. You have to have some pretty well-grounded estimates before anyone wants to talk to you." According to Rother, AARP uses economic modeling and sophisticated impact-analysis to determine the effect of changes in entitlement programs.

In addition to the information it has amassed over the years, AARP relies on member surveys and correspondence, its own public-policy division's research, and public databases of demographics and congressional activity to inform its research. And Cablk recently revamped the organization's publications-ordering process to allow volunteers to obtain research and publications online from area offices within 48 hours, instead of the usual six weeks.

AARP's rapid gathering and dissemination of information relating to the Nutrition and Labeling Education Act of 1989 is typical of how the organization approaches research. AARP needed to know what information its constituency wanted food manufacturers to include on their packaging. So in addition to checking public sources of nutrition information, it enlisted area offices and volunteers to solicit members' views and queried its membership-correspondence database for letters received on the subject. Using this data, the organization created a report for federal legislators stating AARP's position on the act and enumerating the concerns of AARP members who were having difficulty monitoring their diets under the current labeling rules.

Once it has compiled its data, AARP begins mobilizing members who know the most and care the most about a given issue. A few days before a vote, the organization searches its integrated volunteer database for state volunteers with relevant expertise; it also identifies members who would be affected by the legislation. AARP then sends those people—whether there are five or 2,000 of them—a Legislative Alert telegram, which outlines the issue, AARP's position, the potential consequences of passage (or nonpassage) and when the vote will take place.

State volunteers may, in turn, send out alerts to local members, notifying them of the upcoming vote, explaining the issues and urging them to write to their representatives (many of whom also receive the alerts). The alerts generally include contact information for members of AARP's State Legislative Committee, as well as names, addresses and phone numbers of senators and representatives. Local AARP chapters also schedule question-and-answer forums for legislators and volunteer lobbyists.

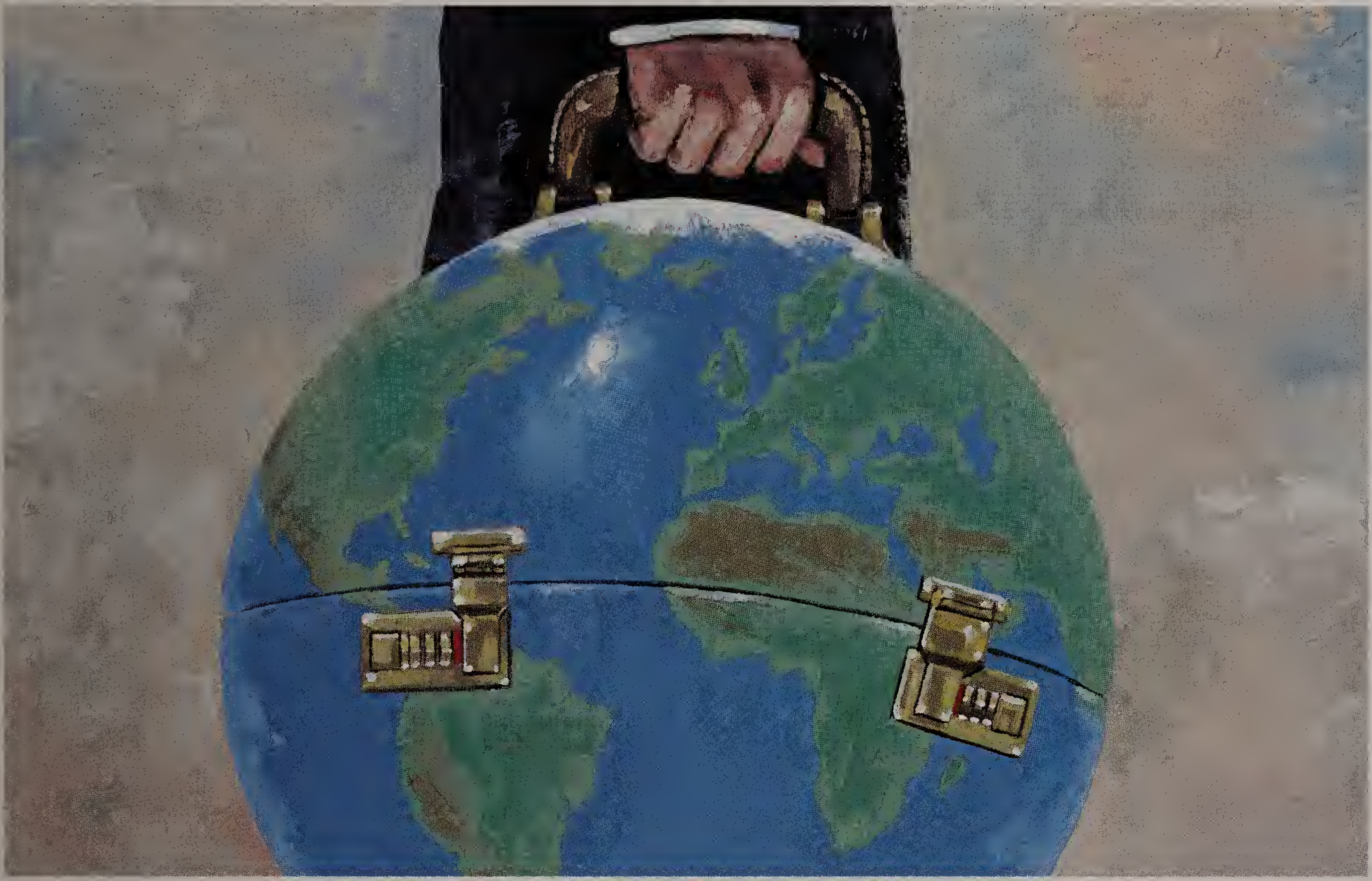
What emerges is a picture of a vast and committed political force skilled in arming and deploying its most effective warriors. And while technology supports staff and volunteers, AARP's phenomenally successful lobbying is truly human-powered—via letters, phone calls and newsletters. For example, volunteer A.D. Copestakes, who serves as chair-

Supplying complete, accurate and timely information to its volunteers is vital to an organization that relies heavily on grassroots lobbying activities.

PHOTO BY BILL TRUSLOW

Going Further

Staying Closer



Global Communications–Close at Hand

BT™ gives you global communication tools as convenient as your briefcase. In any time zone, in any office. We'll help you take your business further, but keep you closer to your customers, your goals, your target.

BT has a global presence our competition can't match. We speak the language, know the culture. Our TYMNET® Global Network reaches 90% of the world's business centers in more than 100 countries. We monitor our own technology, and bill in one currency, part of a single-vendor solution that makes your life easier.

We help you plan your network, manage it, make sure everything plugs in where it should and meets the regulations it should, at locations worldwide. Our Global Network Services℠ (GNS) bring your far-flung divisions closer, with international messaging, frame relay, transaction services, and EDI.

Grab the BT briefcase. Call **1-800-872-7654** (US) or **1-800-874-7654** (Canada). BT North America, 2560 North First Street, PO Box 49019, San Jose, CA 95161.

Global Network Services • ExpressLANE™ Frame Relay/LAN Interconnectivity
Videoconferencing • EDI*NET® • BT Messaging Services • Electronic Transaction Services

BT™

2025-202B

man of AARP's New Hampshire State Legislative Committee in Concord, puts out a newsletter that follows upcoming state and national legislation and tracks which legislators are leaning which way. The 2,000 copies of Copestakes' newsletter go to volunteers, the presidents and legislative chairpeople of New Hampshire's AARP chapters, congresspeople and the governor. "If you're on their team, you get listed in it," said McLane. "If you're not, they [record] that. That's good lobbying."

A robust and growing communications network and an arsenal of databases packed with information on members, volunteers, legislators and legislation directly enlighten and educate AARP's foot soldiers.

Of course AARP does much more than champion the interests of people over 50. Personal services are at least as important as political activism to AARP's members, many of whom are undergoing enormous life changes. For example, to address the unhappy confluence of rising medical costs and fixed incomes, AARP has negotiated deals with outside organizations to provide members with significant discounts for a wide variety of services and products, ranging from insurance to prescription drugs. The organization offers education, training and counseling in a variety of areas: personal finance, health and long-term care, safe driving, legal issues, employment, medical insurance and bereavement, to name just a few.

These services are largely run by volunteers. AARP uses data drawn from its volunteer database (including special skills and positions previously held) to fill positions and move very active volunteers up the leadership ladder within their states. "The business we're really in is providing service and support to those volunteers as they go about meeting the needs of the community," said Nelson.

Also supporting these services, as well as AARP's lobbying activities, is an executive support system located in the Washington home office. The ESS provides AARP executives with snapshot information about financials, membership trends, programs, progress on legislative initiatives, the volunteer base and the needs of the national membership. Executives pay particular attention to gaps in services and programs from state to state, and their analysis of that information is funneled out to field staff and volunteer leaders so they can make more and better decisions about resource allocation.

The baby boomers, that most populous and demanding of generations, are rushing toward maturity. Issues that affect the elderly can swing an election, as they did in Pennsylvania's senatorial race; or powerfully influence campaign rhetoric, as evidenced by the Florida primaries. Consequently it appears inevitable that AARP will continue to grow in size and influence. And the organization's technical virtuosity will likely develop apace: Cablk says that AARP's future holds more LAN-based applications, relational databases, GUIs, object-oriented programming, multimedia, optical disks, CD-ROM, fiber optics and satellite communications.

That AARP's increasing power will stir the controversy over the influence of special interests seems likely. Some people have already begun agitating for restrictions on such groups in order to protect those less proficient at representing themselves. Senator McLane, however, has a different solution. Rather than vilify AARP, she suggests that those who feel disenfranchised should follow its example. Band together. Mobilize dedicated volunteers. Learn how to make yourselves heard.

TECHNICAL PROFILE

The American Association of Retired Persons (AARP) is a non-partisan, non-profit organization with 1,200 employees, 34 million members and 400,000 volunteers that uses two data-processing centers, one at its Washington headquarters and one in California. Its two 20-floor "smart" towers in Washington, built three years ago, are a showcase of communications potential: Every office is wired for Ethernet and 100MB FDDI to handle voice and video in real time. There is a computer center on every floor, and conference rooms are wired for video teleconferencing.

Large and Midrange Systems: A DEC VAX cluster in Washington runs about 139 applications and powers 400 terminals. In California, an IBM ES/9000 runs the biggest applications: the Membership Information Processing System and AARP's financial systems.

End-User Computing: AARP has about 14 Novell LANs running at its headquarters and expects to have 20 nationwide within the next few years. The organization has 1,355 micros (IBM PCs and Apple Macs) and about 400 Zenith laptops.

Software: AARP uses about 40 proprietary applications and is taking advantage of CASE, 4GLs and Joint Rapid Application Design (JRAD).

Networking: AARP uses dedicated 56K lines to connect its 15 sites across the country.

Backup: Critical applications are backed up at a disaster-recovery site in Atlanta incrementally every day, and in total once a week.

How To Keep People Outside Your Business From Knowing Your Business.

© 1992 AT&T

AT&T Secure Communications Products. For better protection of your company's information.

According to F.B.I. statistics, more and more conversations and transmissions are being intercepted. Intercepted by a company's competitors, by computer hackers and even by vengeful former employees.

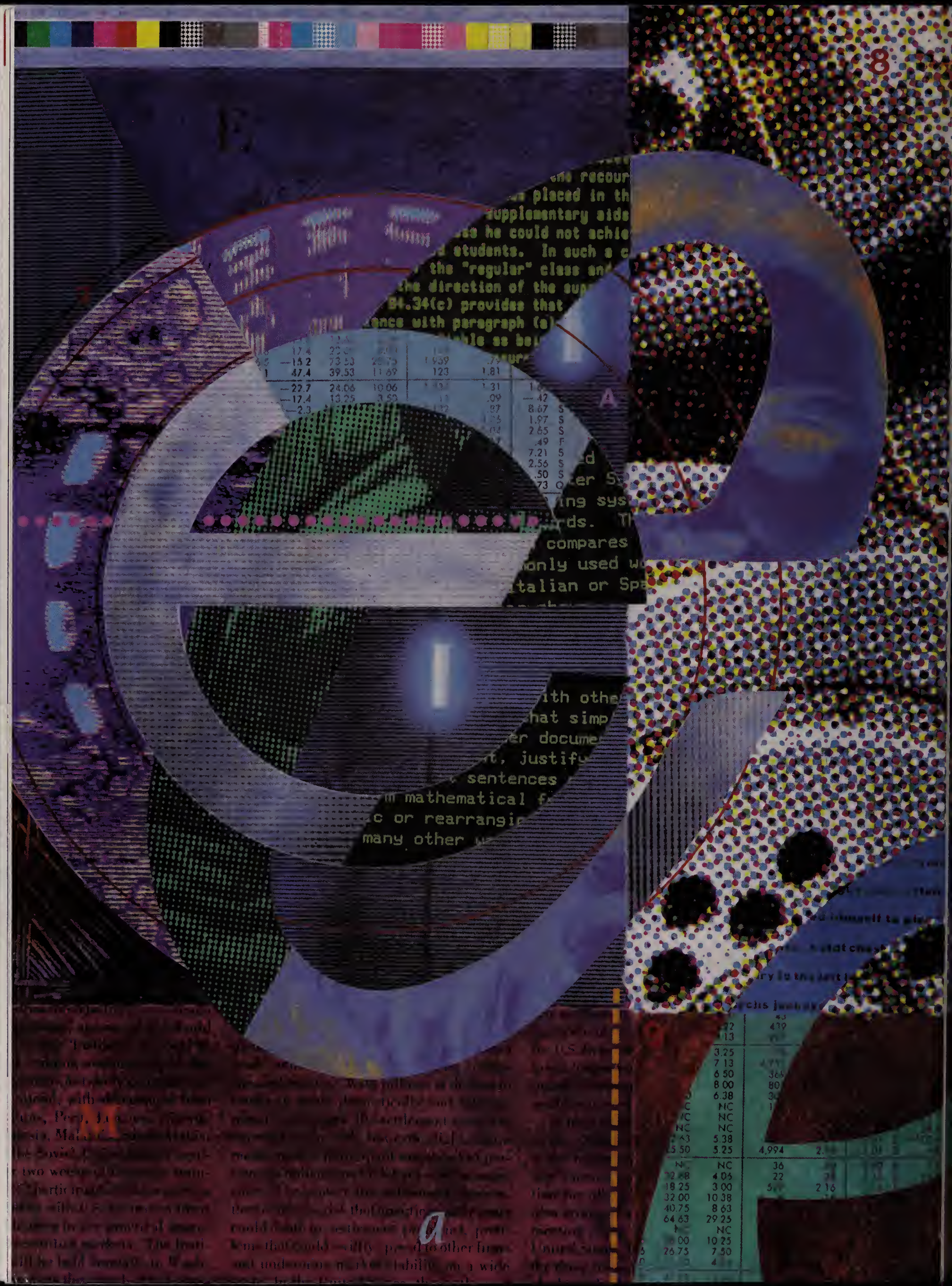
But there is a way to protect your company's confidential information—AT&T's family of secure communications products.

AT&T offers secure telephones, cellular terminals, video units, data products and more. This equipment protects your sensitive information—over your own private network or the public switched network. So you can keep unwanted intruders from knowing your business.

With all these products you also get outstanding price/performance value. Comprehensive service and support with a toll-free hotline. Warranties that are unmatched anywhere. Overnight replacement of a failed unit. And, of course, the reliability that only AT&T products deliver.

To learn more, call AT&T at **1 800 243-7883 ext. 400.** Because if you're not protecting your company's information, you're not protecting your company.

AT&T
The right choice.


8
placed in th
supplementary aids
he could not achie
students. In such a c
the "regular" class and
the direction of the sup
84.34(c) provides that
ance with paragraph (a)
compares
only used w
italian or Sp
ith othe
hat simp
er docume
justify
sentences
mathematical f
c or rearrangi
many other w
a

IT *and the* POWERS THAT BE

It used to be that only radio and television were considered 'electronic.' Now all the media are beginning to swirl together in a vast electronic soup. Doing the stirring is information technology, enabling increasingly customizable recipes for messages.

BY KATHLEEN MELYMUKA

When it comes to IT, there's no such thing as the media monolith. Behind the newspaper front pages, glossy magazine covers and numbing profusion of television channels, print and broadcast media outlets are predictably diverse in their embrace of information technology and the sophistication with which they use it.

Still, some useful class distinctions can be drawn. For newspapers, technology is yesterday's news; they are and always have been aggressive technocrats. Magazines (*CIO* included) increasingly rely on desktop-publishing technologies, and some are on the cutting edge of database-driven custom binding. Book publishers have traditionally been slow to embrace technology, but many are finally catching on with IT-supported production and accounting systems. For traditional TV broadcasters, a key technology application is to manage the inventory of available ad slots. Cable television operators use IT chiefly to improve their marketing and service quality, with some planning interactive links to viewers.

Among the slow learners, book publishing is just coming around. "For book publishing companies, finding a way to speed up the time and quality of processing, shipping and post-sale inquiries is a major challenge and presents a major opportu-

ILLUSTRATION BY ALAN MAZZETTI

nity," said Linda Peters, vice president of the San Francisco office of CSC/Index, a management consulting firm.

McMillan Publishing Co. of New York is among the leaders in the industry in seizing that opportunity. Internally, computers track sales to very specific market channels and display the information on a PC network. "Market channel information is vital for publishing," said Barry Lippman, president and publisher of the adult trade division and trade sales. "In effect it gives you a CAT scan of sales, and you can slice it any way you want."

All finance and production costs on each title are also gathered on the network. "I can find out how much we've spent on each title to date: cover, typesetting, marketing and so on," Lippman explained.

McMillan is also moving toward desktop publishing. Within a year or so, books will flow electronically from author to compositor. "We can save three or four months in the [nine- to 12-month] production process by doing it electronically," Lippman said. "There's a tremendous advantage for cash flow."

CUSTOM PUBLISHING LETS PUBLISHERS AND ADVERTISERS ADJUST THE CONTENT OF MAGAZINES FOR DIFFERENT TARGET AUDIENCES AMONG SUBSCRIBERS.

In the magazine business, where desktop publishing is ubiquitous, technology is being turned to more exotic uses, notably in marketing. Custom publishing lets publishers and advertisers adjust the content of magazines for different target audiences among subscribers. *Time*, a leader in the field, uses some degree of custom publishing in every issue. *Time*'s database of subscribers includes a field for alphanumeric codes identifying "target selects," such as top executives.

Magazines are put together on a "binding line," an automated assembly line made up of a series of sections—some "national," some "custom"—that are inserted in response to individual subscriber data as each subscriber's issue goes by.

There are also custom ads. A car manufacturer, for example, might run a normal ad for most subscribers, but provide a service-oriented ad for recent buyers of the particular make of car. "We take a tape of [the advertiser's] customers and do a merge/purge where we match the advertiser's list against our own subscriber list," explained Brian O'Leary, *Time*'s production director. Matches trigger the inclusion of the service-oriented ad.

Technology is making it possible for people who are not traditional publishers to get into the publishing business, according to George Sacerdote, vice president and managing director for the management analysis section at Arthur D. Little, a consulting firm in Cambridge, Mass. "IT is the factory by which the product is produced, and in some cases the medium by which it is delivered."

That is the case with *First!*, a custom daily "newspaper" from Individual Inc., of Cambridge, Mass. Individual Inc.'s clients designate areas of interest, and an expert system picks appropriate news stories from a database of primary business and industry news sources. The result is formatted into a newsletter and either faxed or E-mailed first thing each morning for individual use or integration into a company network.

FOR THE ELECTRONIC media (a term that may have lost some of its usefulness since most publishing companies are now to some extent electronic), the technology agenda follows two basic paths: one for broadcast TV and radio outlets, the other for cable.

In broadcast programming, technology is used in the creation of special effects and in the video controller, which coordinates input from networks, off-site camera crews, prerecorded cartridges, on-air performers, cameras and character generators. But the real business of television and radio is selling ads, and to do it right you need an inventory-management system that would cause a widget-maker's head to spin.

"Nothing is more perishable than broadcast air time," said David Fishman, vice president and director of the media and entertainment practice at Arthur D. Little. "You have to sell it, sell it for the right price and know you haven't sold it previously. It's a very complicated business of balancing inventory, and it's been computer-controlled for as long as there have been computers."

The systems are similar to those

Putting Viewers in the Picture

Interactive television allows Montreal cable subscribers to call the shots and even sing along

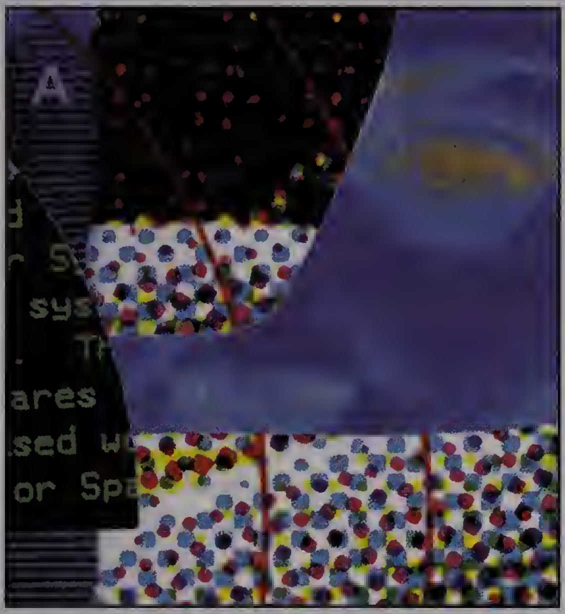
If interactive TV is the wave of the future, in Montreal the future is now. For the last two years, TVI in Montreal, a division of a cable company called Groupe Videotron Ltee, has been offering viewers the chance to take control of their sets as never before, with an interactive video service called Videoway.

A normal-looking converter box

contains the usual decoder as well as a 4 Mbps modem and an 8-bit microprocessor. At the other end is an IBM 9000 running a proprietary transaction-processing system. The hand-held remote controller includes four function buttons that provide video games and consumer information options including shopping, stock quotes, banking, travel and other professional services—nothing revolutionary there. But other features turn couch potatoes into armchair directors.

Viewers watching sporting events can use the function buttons to choose different camera angles or call for instant replays. Concert watchers can zero in on different performers and get close-ups and sing-along text. News viewers can opt out of the regular newscast for in-depth treatment of various stories. Viewers can also solve murder mysteries or become the fourth player on *Jeopardy!*

Videoway offers advertisers two unique advantages: Because TVI



knows such details about subscribers as their age, sex and income, it can send custom commercials to specifically targeted audiences. It also lets advertisers get into the act: One interactive commercial allows viewers to choose from ads shown in various countries; others enable them to order advertised products without getting up from the couch.

–K. Melymuka

used by hotels and airlines, Fishman said, but more complex. After all, a hotel may have hundreds of rooms to sell, an airline may have thousands of seats, but a broadcaster has "gazillions" of "avails"—time spaces—for sale at an enormous range of prices.

While broadcasters' customers are the big advertisers, cable operators' customers are their subscribers, and the big issue for cable operators is churn: subscribers disconnecting. In any given year, nearly half the subscribers to a cable premium service (such as HBO) will quit, according to Bill Battino, a director in New York-based Coopers & Lybrand's strategic management services group specializing in media and communications companies. Some of these defecting customers may come back, but the churning is costly to cable operators. And so cable companies are "using market-segmentation programs, trying to better understand where churn comes from," Battino said. "They're focusing on market retention. They want to keep their customers happy."

Another issue for cable operators is the nuts and bolts of customer service — maintaining the infrastructure. "They're looking into how to manage truck fleets, how to schedule installers, how they monitor for system outages," Battino said.

Not only do cable operators want to deliver better service; they want to deliver more, and video compression will make that possible. Similar in principle to the text compression used in mass-storage devices, video compression filters out unneeded parts of a transmission and squeezes the rest. It will enable cable operators to offer three to four times as many channels over the same system. (In the New York area, a pilot project by cable operator Time Warner is offering selected subscribers 150 stations.)

"That is a critical technology for [the cable industry]," said Battino. "By 1995, 50 percent of cable systems will employ [it]."

THE COAXIAL CABLE THAT brings all these viewing options into subscribers' homes can also carry a signal back in the other direction. By virtue of this two-way connection with viewers and the ability to select who receives a signal, cable television will be the medium for one of the key developments of the '90s: interactive TV (see related story), according to Battino. (Radio-frequency technology extends this capability to conventional broadcasters as well.) Individual cable stations, however, will be focusing on the more mundane: how to keep costs under control.

Orange County NewsChannel, of Santa Ana, Calif., is doing this by using PC hardware and off-the-shelf software for most of its programming needs, according to Ed Casaccia, executive producer.

Orange County has also decided to forego live programming, the hitherto indispensable staple of TV news. "In the context of 24-hour-a-day news, we do almost nothing live," Casaccia said. In his view, there is nothing lost. "There's no correlation between live and current," he said. "A script will sit around two to three hours waiting for someone to read it live." Not at Orange County. A script is written, recorded on tape,

> FOR SOME NON-TRADITIONAL PUBLISHERS, "I.T. IS THE FACTORY BY WHICH THE PRODUCT IS PRODUCED, AND IN SOME CASES THE MEDIUM BY WHICH IT IS DELIVERED."
>
> *—George Sacerdote*

has graphics added, and within minutes it's a little module of television waiting on a database to be played back at the appropriate moment by a proprietary automation system.

"That allows us to never start from scratch and produce a whole program," Casaccia said. "We can change an individual story without having to redo a whole newscast. It also allows us to take the work that numerous people have to do all at once to execute live and have one person do it sequentially." The result: In terms of hours of news produced per employee, Orange County is about 15 times more efficient than a traditional network station.

> THE BIG ISSUE FOR CABLE OPERATORS IS CHURN: SUBSCRIBERS DISCONNECTING. IN ANY GIVEN YEAR, NEARLY HALF THE SUBSCRIBERS TO A CABLE PREMIUM SERVICE WILL QUIT.

The issues driving technology in the print and broadcast media turn out to be the usual suspects: market information, finance, manufacturing, custom products and services, inventory management, quality control, cost effectiveness. And the companies getting the best results seem to be the ones willing to shake things up.

"If you apply technology on the basis of 'I don't want to change the way I'm doing things,' there won't be any gain," Casaccia said. "We said, 'How efficiently can we do this by throwing technology we know—or can imagine—at it?' " CIO

Kathleen Melymuka is a freelance writer based in Duxbury, Mass.

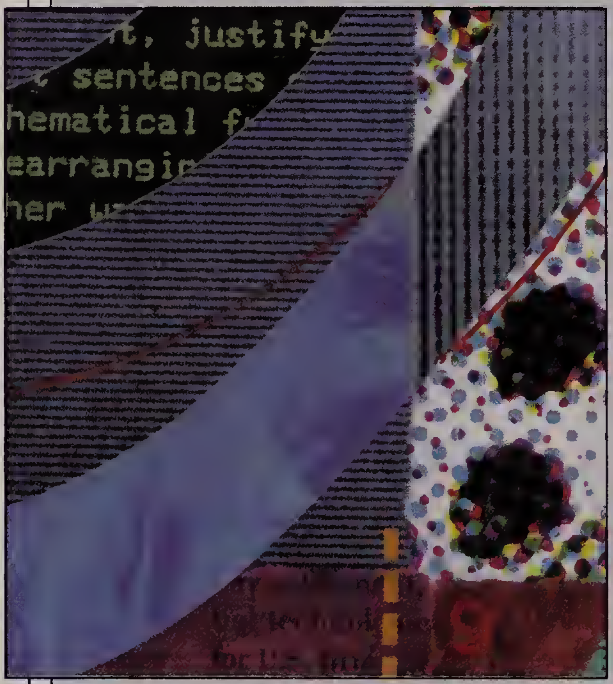
A Book to Satisfy Every Reader's Taste

Database-driven custom publishing turns the customer into an editor, able to select and arrange the contents of books

Book publishers rarely cause a tremor on the technology Richter scale, but McGraw Hill Inc. in New York has registered a big one with Primis, an electronic custom book publishing system. Available in a broad range of disciplines and now being used in about 250 universities, Primis allows a professor to design a textbook virtually from cover to cover using materials gleaned from a wide variety of sources.

"It's a very simple concept," said Robert Lynch, vice president and director of Primis. "It gives teachers the opportunity to combine current articles and really sculpt a book to meet his or her needs in the classroom."

The client selects from a catalog of items—these can include chapters from text books, various problem sets, articles from magazines, case studies from the Harvard Business School, even poetry—and puts them in the order in which he or she would like them to appear. The system pulls the appropriate files from a database and refolios the material, assigning consecutive page numbers and applying a unified look. It then creates a table of contents, title page and index. Finally, the individual book is bound and shipped directly to the client, who may then choose to order multiple copies.



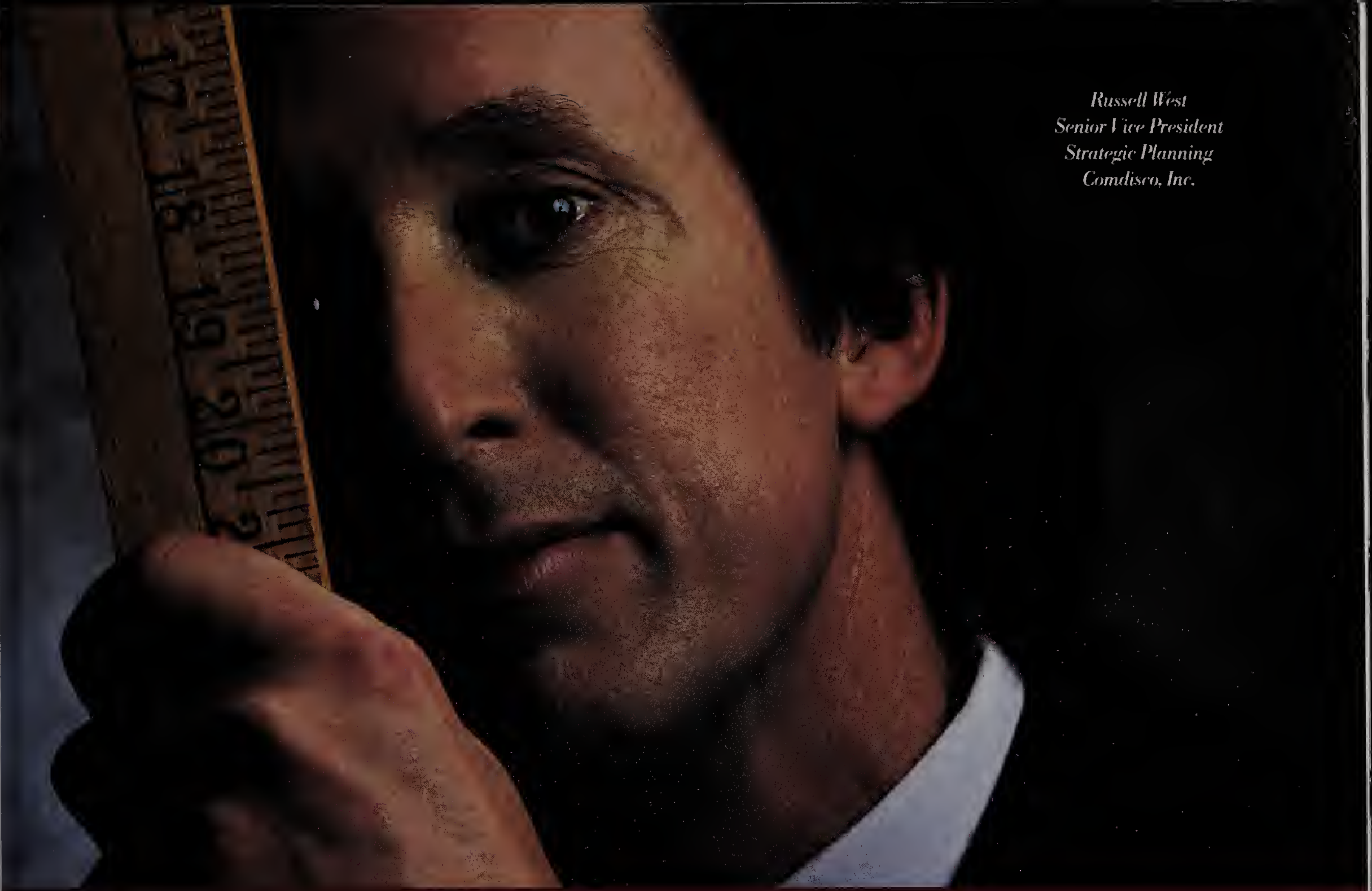
"It's just-in-time manufacturing," said Lynch. "There is no warehousing, no inventory, no out-of-stock or out-of-print."

Primis uses Postscript page-composition software (from Adobe Systems Inc. of Mountain View, Calif.) as well as proprietary software. High-speed electronic printers print the books.

"What Primis does can be done in a lot of desktop systems, but it's not a desktop system," said Lynch. "It's a full production system, meaning that we can produce thousands of books, tens of thousands, whereas a desktop does one or two in a day.

"It really meets market needs," he said. "That's the reason we're doing it, not because it's such a slick technology. It gives readers the information they want in the manner they want it."

–K. Melymuka



Russell West
Senior Vice President
Strategic Planning
Comdisco, Inc.

"There is a way to measure the quality of your technology decisions."

"Don't reduce your technology costs in such a way that they can't *continue* to be reduced. The last thing you want is to save budget dollars today at the expense of mortgaging your future.

"With the right strategy, it's possible to continually reduce your costs. Is your current strategy letting you do that? To find out, use the market as a yardstick. Compare what's been happening to your expenses over the last few years with market trends. Then look at what's likely to happen in the future. That'll tell you the answer real fast.

"Every good technology strategy is built on a sound financial footing. That takes market knowledge and creativity. And that's where Comdisco excels.

"If you're not sure whether your strategy measures up to the realities of today, talk to us. We'll show you some smart ways to solve your problems, and we'll save you money. That's Comdisco's job, and nobody does it better."

Comdisco is one of the world's largest and most experienced independent high-tech asset consultants.
Our strength is people like Russ West...people who know your problems and how to solve them.
Let us show you how to measure—and improve—the quality of your technology decisions.

COMDISCO®
HIGH-TECH ASSET MANAGEMENT SOLUTIONS

FOR A FREE
INFORMATION PACKET
CALL 708-698-3000
EXT. 4530.

FRONTLINE

PHOTO BY WEBB CHAPPELL

BY PORTIA ISAACSON

The coming generation of personal computing and communications devices should be dubbed "MCs," for both "mobile computers" and "mobile communicators"

The Big Picture

NAMING I.T.

If we had named the rose "thorn," it may have smelled as sweet but we might not have noticed. If you as CIO think of the new breed of mobile, communicating computers as PCs, you may miss the biggest technology-enabled opportunity of your career.

I propose that we name the new breed "MC," for both "mobile computer" and "mobile communicator." In the 1990s, ubiquitous MCs will force and enable the structuring of enterprise computing and communication just as pervasive PCs did in the 1980s.

The new mobile computers are anything but desktop computers with the air sucked out—as notebook computers have been. The new breed is represented by subnotebooks, palmtops, pen computers and even Apple's PDAs (personal digital assistants).

Sales of clamshell, keyboard-only notebook computers in 1991 (over 1 million units in the United States) proved that people want computers they can take along. Now innovative designs such as the BCC Avanti, TI Win486 and NCR Safari are causing companies to replace their old notebooks long before they are depreciated.

Sales of take-along computers will surpass sales of stationary PCs within just a few years. The CIO that ignores the unstoppable movement to mobile computing will miss the biggest opportunity since computing itself: the opportunity to lead the reengineering of his or her enterprise.

The CIO that ignores the unstoppable movement to mobile computing will miss the biggest opportunity since computing itself: to lead the reengineering of his or her enterprise.

Fall 1992 will see an explosion in new-concept MCs. The enabling technologies are generating a host of creative new products, including PCMCIA's PC Card; Microsoft's Windows for Pen Computing; GO's PenPoint; 1.8-inch hard-disk drives, such as MiniStor; and wireless communications, such as ARDIS and PHOTONICS.

What should the CIO's role be in considering MCs? To provide vision and leadership. Can't MCs fit under the PC-purchasing, -management and -support organizations? No, no and no. Mobile computing, with its integrated choices in communications, is a complete break with personal computing. And it's a break the CIO needs.

Here's the situation: Reengineering is critical to the survival of today's enterprises, and mobile, communicating computers can play a central part in that reengineering. Moreover, MCs will soon be more powerful than workstations and less expensive than clone PCs. Glimpse the possible.

Reengineering enabled by mobile computing will melt frozen assets such as buildings, reduce the layers of management required to link the worker to the CEO, and act as the key enabler for reengineering the delivery of value to the customer. The CIO has the chance of a career to lead and support his or her company through these changes as information technology bridges the gaps from worker to worker and from worker to enterprise.

Get out a big, big sheet of blank paper and sketch a new enterprise from the customer back to the CEO. Show information flows instead of buildings. Show IT-linked workgroups, not geography-based ones. Show a lean enterprise with valued, intelligent, informed and empowered workers linked in dynamic, flat, networked organizations delivering ever-increasing value to customers. Sketch the possible, then gather your courage. Businesses based on industrial-era, many-layered hierarchical structures will not survive this final phase of the transition to the information age. The CEO needs IT and your vision of the possible.

The CIO's Pragmatic Vision

PROPOSING THE POSSIBLE

Vision is a prerequisite of leadership. Although some of us have more talent for it than others, vision can be developed and honed. The first step is to ask how.

The most important trick to being visionary is to pick a point just far enough in the future to encourage the imagination of dramatic differences, not just minor changes, from the present.

There is a trick or two to being visionary. The most important is to pick a point just far enough in the future to encourage the imagination of dramatic differences, not just minor changes, from the present. For example, imagine IT and your business in great detail in 2002. Map (draw, write and talk about) with great detail and clarity everything about your enterprise at that time (its customers, the value it offers, its competitors, industry, markets, people, assets, in-

PLACE
STAMP
HERE

Digital Consulting, Inc.
204 Andover Street
Andover, MA 01810-9853

YES!

I'm interested in the Downsizing EXPO Conference & Exposition, August 25-27, 1992, at the Moscone Convention Center, San Francisco, CA

FAX TO: 508-470-0526	Mail this card to DCI	Register at the Door

☐ **Please send me a Brochure**

☐ **Please send me ______ FREE Downsizing Exposition Passes**

Name ____

Title ____

Company __________________________ **Mail Stop** ________

Address ____

City, State, Zip __________________________________

Phone ____________________ **Fax** ____________________

A4VVJF

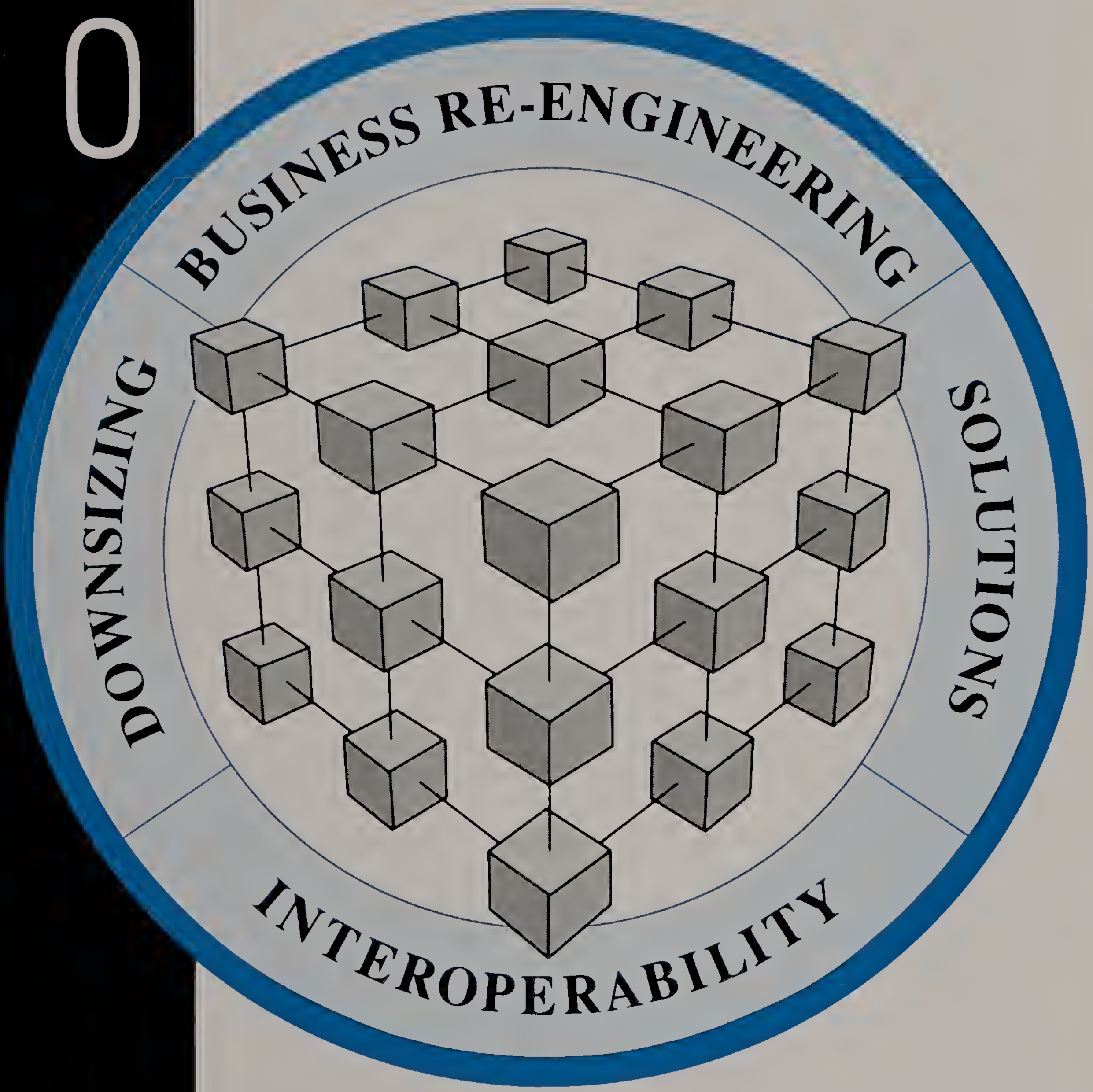
DOWNSIZING EXPO

The Original and
Most Extensive
Downsizing
Conference
and Exposition
Expands

AUGUST 25-27, 1992
Moscone Convention Center
San Francisco, California

Four Events In One:

- The **Downsizing** Conference
- The **Interoperability** Conference
- The **Business Re-Engineering** Conference
- The **Solutions** Exposition



Over 100 Industry Experts

George Schussel
Co-Chairman

Larry R. DeBoever
Co-Chairman

- Marcia Blumenthal
- Cheryl Currid
- Esther Dyson
- Rich Finkelstein
- John Gallant
- Portia Isaacson
- Ted Klein
- Ron Peri
- Roel Pieper
- Jeffrey Tash
- Amy Wohl
- William Zachmann

. . . and many more

Fifteen Comprehensive Conference Tracks

- Client/Server Applications
- Client/Server DBMS
- Windows Applications
- Windows Technical Track
- Security and the Downsized System
- Downsizing Experiences
- Downsizing Platforms
- Open Systems
- Enterprise Networks
- Middleware
- E-Mail and Enabled Technologies
- Process Re-Engineering
- IS Re-Engineering
- Leveraging "Next Generation" Technologies
- The Resellers' Showcase

Plus... **The Solutions Exposition Spotlighting Over 200 Companies**

Call (508) 470-3870 for information on exhibiting.

Co-Sponsored By:

- Andersen Consulting
- Compaq Computer Corp.
- Computer Associates
- Digital Equipment Corporation
- Hewlett-Packard Company
- Ingres
- Integris
- Marathon Systems
- NCR Corporation
- Novell, Inc.
- Texas Instruments

Sponsored By:

DCI
Digital Consulting, Inc.

Call (508) 470-3880 to register or receive a 32-page information-packed brochure.

formation technology—everything).

Focus on the chosen time, not on how to get there. Of course, more than one future may be possible. Map three or four and pick the one you prefer. Only after a very clear map is made of the chosen future should you plot how to get from it back to the present. Visionary CIOs are caught up in the details of their chosen futures and are constantly communicating pragmatic ways of moving the enterprise from the present to a better, more value-creating and productive existence. I recommend reading *Future Perfect* by Stan Davis for more insight into this process.

As CIO, you must be accurate in your description of future information technology and illustrate in the language of business what will be possible with ever-more-rapidly improving computer and communications technologies. Then you must be able to support implementation, deployment and even end-user self-management of information technology. How can next year's IT be used to increase the value delivered to customers? Can IT-based information flows replace inefficient distribution channels? Can IT assist salespeople in their presentation of products and services? Can it link your customers more directly to your enterprise and make allies out of competitors? What business structures will be possible with IT next year? What will be possible five years from now? What type of IT systems will your competitors deploy? There is no end to building the future.

IT Platform 2002

PLANKS IN THE CIO'S VISION

The laws under which today's new enterprise information systems should be proposed and planned are those of the emerging era of ubiquitous, frontline IT. The laws that will form the framework of IT Platform 2002 are:

1. The purpose of information technology is to support people in the creation, delivery and exchange of value in products, services and currency with customers.

2. Customers, market researchers, salespeople, resellers, marketing partners, factory teams, parts suppliers, banks, stockholders, CEOs and other stakeholders are linked by information systems that enable the efficient purchase, design, funding, manufacture, delivery, integration and support of goods and services. Businesses are evolving from the physical form of the industrial, mass-production era into an information form.

3. IT is with people whether they are in trucks, meeting rooms, factories, airports, homes—and even at the desks that still exist. Businesses spend more money on MCs and on MC communications services than they do on all other forms of computing and communications combined.

4. MCs are the design center of enterprise information systems. Desktop basestations serve as phone, fax and wired LAN connectivity hubs and as personal and workgroup information repositories as well as bases for bulky peripherals. Mainframe and midrange systems as well as LAN servers are transparent information warehouses, secondary to personal basestations in their IT architectural significance.

5. Communications systems use wired and wireless technologies to create global, regional and local webs of data paths that are dynamically chosen by a subscriber MC based on availability and economics for a specific task. Universal modem and marketing alliances by service providers are just beginning to ease the complexity and fragmentation that has limited the utilization of MC communications services.

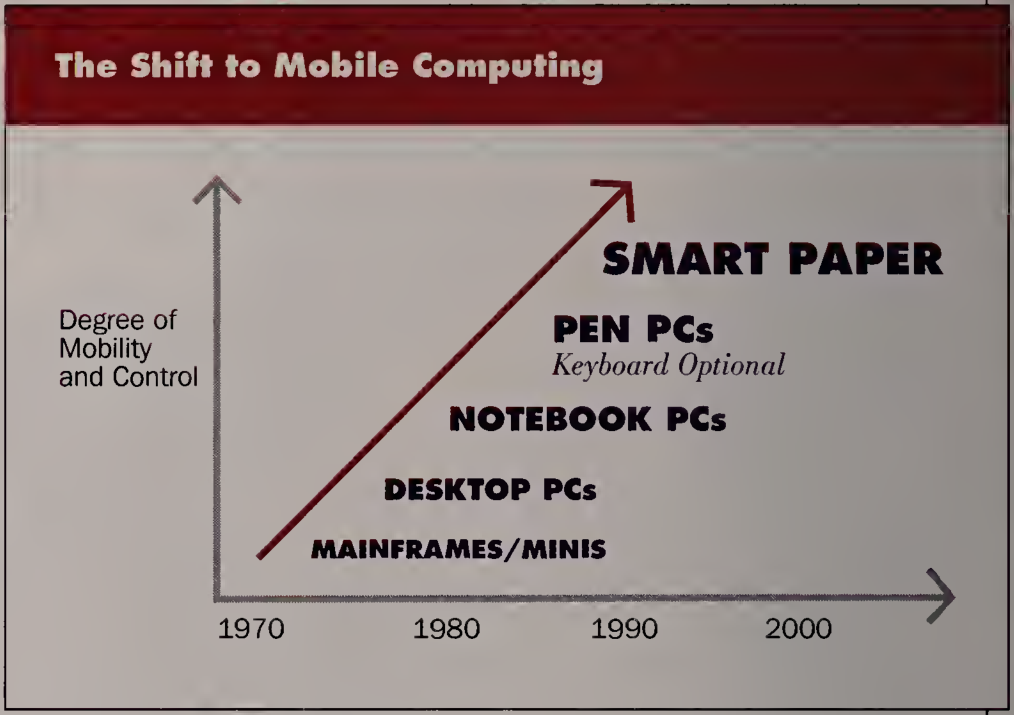
6. Most encoded data is entered into or updated in enterprise information systems via either optical character recognition of fax images or the recognition/translation of electronic ink handwritten on pen computers. Handwritten notes, forms and other paper are stored in enterprise information systems as images or electronic ink.

7. People-to-people communication dominates connectivity issues. Peer-to-peer networks are in. Servers and basestations facilitate client-to-client communication and act as repositories for workgroups, enterprises, industry groups and families.

8. Desktop basestations, MCs and consumer electronics share a common media and expansion standard in the PCMCIA PC Card. One of these credit-card-size gigabyte wonders stores thousands of pages of notes, nearly a thousand color photographs or nearly a million customer records.

9. The focus of collaborative IT is wireless MC-to-MC with simultaneous voice and fax. In group meetings, overheads have been replaced by intelligent image receivers.

10. Fax exchange of images of paper is the most common form of business mail as well as a key determinant of storage requirements on personal basesta-


The Shift to Mobile Computing

Do you notice anything unusual about this man's computer?

No, it's not an aberration of Newtonian physics.

This man's computer stays attached because he's wearing it. That's right, wearing it.

With the introduction of PalmPAD,™ GRiD has created far more than just a new pen computer. We've set the new standard for data collection applications.

Frankly, nothing is easier to use. Entering data, drawing graphics and capturing signatures is a snap.

And PalmPAD is light. Only 2.8 pounds.

Yet, it's tough enough to withstand a 3 foot drop without suffering brain damage.

GRiD PalmPAD also features a large backlit screen. Plus, it's MS-DOS® compatible. So you can customize software applications in no time at all.

And because PalmPAD was designed to accommodate either a modem or a spread spectrum radio, your work force will become a mobile communications center.

Does this mean the end is near for paper forms and conventional handhelds? We think so.

Because whether your mobile work force collects data on their feet, or hands for that matter, nothing improves the speed and accuracy of collecting information like PalmPAD. For more information, call 800-222-GRiD. And hear about the computer that's turning an industry on its head.

GRiD®
Wherever work gets done.℠

GRiD Systems Corporation, 47211 Lakeview Boulevard, P.O. Box 5003, Fremont, CA 94537-5003. For information in Canada, call 800-387-0174. In Europe, fax us in the U.K. at (44) 081-759-0466. For South America, Asia, Pacific Rim and the Middle East, fax us in the U.S. at (415) 683-0903.

©1992, GRiD Systems Corporation. PalmPAD is a trademark of GRiD Systems Corporation. All other brands are trademarks of their respective holders.

tions and servers. Editable forms of images as well as integrated voice are being adopted as advanced fax standards.

11. Relative to all other business costs, the cost of IT is approaching zero. More time is spent debating the productivity of buildings than the productivity of IT.

Relative to all other business costs, the cost of IT will approach zero. More time will be spent debating the productivity of buildings than that of IT.

Refining or even completely rewriting this IT Platform 2002 is a key part of the CIO's job. After IT Platform 2002 is accepted, then IT Platform 1997 should be drafted and presented as part of the five-year plan. Today's decisions are much easier when we have a clear vision of the future we are building.

Unmixing the Metaphor

THE BUSINESS-AS-WAR THING

War is about destruction, about fighting over limited geographical territory. Business is about the creation of unlimited value for customers. Yet the business-is-war metaphor does have some utility.

In this metaphor, customers are both the battlefield and the territory under dispute. Products and services offered to customers are weapons. Your company wins a battle with an enemy competitor each time a customer chooses your product or service. The war for a product class is won when your company is the only remaining supplier in your target customer set—in other words, your firm has 100 percent market share. (For further explanation, call Bill Gates.)

In the business of war, the CIO reports to the General. The purpose of IT is to support the troops at the front and to link them to each other and to the command center in a real-time, dynamic feedback system that rivals a living organism. We witnessed the IT-enabled war, Desert Storm.

In the war of business, the CIO's mission is the same: to support the workers at the front in providing value for customers and to link workers to each other and to the command center in a real-time, dynamic feedback system that rivals a living organism. Witness UPS's deployment of electronic clipboards, with trucks linked by the ARDIS network.

Is it possible to win a war with IT? You bet. Sorry, Max, IT may be cheap, but it is as strategic as creative thought.

Coming IT

SMART PAPER

Paper forms and pads are the source of some of the most valuable information in business. From customer orders to engineering notes, paper-based data-capture is today's first step in moving information through the many steps of processing within an enterprise. Some businesses (insurance companies, for instance) are dying under their burden of paper forms, and every knowledge worker moves between the archaic world of paper notes and the emerging world of ubiquitous computing.

Paper forms and pads will soon be obsolete in business. Why? Not because replacing paper with pen computers will save large sums of money by eliminating the data entry that is sometimes required, although it will. Rather, paper forms will be made obsolete by smart electronic forms. These will enable interactive data-capture on pen computers, helping to eliminate several of the in-box/out-box steps of the paper-based world. In fact, most CIOs believe that pen computers with development tools such as Slate Corp.'s PenApps will often replace paper forms, according to a survey by Dream IT Inc.

And what about paper pads? Computer-based note-taking will be such a potent tool that pen computers with note-taking and note-processing applications will make these obsolete as well.

Smart electronic forms will enable interactive data-capture on pen computers, helping to eliminate several in-box/out-box steps of the paper-based world.

Some of the most valuable information is on paper pads. Some workers, like me, have stacks and stacks of paper pads full of notes and ideas and random creative thoughts. I've always meant to cut apart and file these maddeningly linear idea and data stores; however, if I had, I would then have needed to make copies to file under the various categories (subjects, companies, people, dates, projects) by which I organize my universe. Copying and cutting paper is too much trouble, so only the most urgent notes usually get transcribed to the right place. Most of this wealth still languishes in chronologically stacked pads of paper, and there is only a small chance that I will be able to find something when I need it.

But there is hope. Ink Development recently announced NoteTaker, the first computer application that I would classify as smart paper. NoteTaker, which operates on PenPoint pen computers, enables the taking of notes in electronic ink so that a retrieved note looks exactly as it would have had it been written or sketched on a paper pad. A user can also ask for computer assistance in smoothing drawings or making handwriting more legible. At the flick of the pen or the scribbling of a key word in the margin, part or all of a page can be filed under user-defined categories. All the power of the computer is available for search and retrieval. With a few pen taps, a note can be faxed anywhere in the world. Now that's my kind of paper!

NoteTaker is the first of a new class of computer applications that I call smart paper—self-filing, elastic (and perhaps talking). This innovation will eventually become the most broadly used computer application of all times surpassing even word processing — a unique new foundation for groupware and enterprise-ware applications. CIO

Portia Isaacson is president of Dream IT Inc., a Cambridge, Mass., consultancy, publisher and workshop producer dedicated to providing quality information to customers and creators of frontline IT.

To frame relay users tired of being stuck in traffic, Sprint offers the fast lane.

We know. They told you frame relay could zap huge amounts of data from LAN to LAN with lightning speed. But eventually, you found out they could only send your data in dribs and drabs.

Well, take heart. Sprint's Frame Relay service is unlike the others. Because ours doesn't limit the flow of data into the network. Instead, it gives you the capability to send longer bursts of data. Net result: Less delay and greater throughput. Net net result: You spend less time sending and receiving data, and more time using it.

To us, it seemed like a better way. That's why we designed our Frame Relay network specifically around your needs. Ultimately, though, it's up to you: Bumper-to-bumper data. Or the fast lane. **1-800-736-1130.**

Sprint®

Not just another phone company.℠

© 1992 Sprint Communications Company L.P.

CIO

INDEX

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

Company Index

AT&T 14, 38
Adobe 58
Apple 38, 64, 71
Asset Management Co. 14
Avanti 64
Beyond Inc. 71
CBS Inc. 72
Cognos 71
Computer Technology Management Inc. 30
Dana Corp. 14
Data General Corp. 71
Digital Equipment Corp. 38
Dun & Bradstreet Software 71
EDS 30
Eastman Kodak 14
General Mills 14
Genix Corp. 30
GO 64
Groupe Bull 38
Groupe Videotron Ltee 58
Hewlett-Packard 14, 38
IBM 14, 30, 38, 58, 72
Individual Inc. 58
Ink Development 64
Inland Steel Co. 30
Insight Research Corp. 14
Libbey-Owens-Ford Co. 30
McGraw Hill Inc. 58
McMillan Publishing Company 58
MetroWest Medical Center 14
Microsoft Corp. 38, 64
Miles Inc. 14
NCR 64
New Hope Communications 58
Nike Inc. 14
Northern Telecom 14
Novell 58
Octel Communications Corp. 72
Orange County NewsChannel 58
PCMCIA 64
Pilkington Ltd. 30
Powersoft 71
Proxima Corp. 71
Slate Corp. 64
Sun Microsystems 38
Sybase 71
Texas Instruments Inc. 14, 64
Time Warner 58
Xplor International 14

Advertiser Index

AT&T 3
AT&T Paradyne C3
AT&T Technologies 36, 57
Andersen Consulting 17
BMC Software 15
BT North America 55
Bachman Information Systems Inc. C4
CIO Publishing Inc. 20A, 21
Comdisco 63
Compaq Computer Corp. 7
Computer Associates Intl. Inc. . 11, 47
Conference Group 13
Data General Corp. 35
Digital Consulting Inc. 65
Digital Equipment Corp. C2, 12A
EDS 26
GRiD Systems Inc. 67
Information Resources Inc. 45
Informix 33
Lotus Development Corp. 18
Sybase 43
Texas Instruments Inc. 50
US Sprint 69
XcelleNet Inc. 28

Editorial, Advertising and Business Offices: 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208, (508) 872-8200. **Postal Information:** CIO (ISSN 0894-9301) is published monthly; and semimonthly in April, May, June, September, October and November by CIO Publishing Inc., 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. Second-class postage paid at Framingham, MA, and at additional mailing offices. **Reprints:** Copyright 1992 by CIO Publishing Inc. All rights reserved. Reproduction of material appearing in CIO is forbidden without written permission. Send all reprint requests to Permissions Editor, CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. **Photocopy Rights:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CIO for users through the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Massachusetts 01970. Please specify: ISSN 0894-9301. Permission to photocopy does not extend to contributed articles followed by this symbol: ‡. **Microfilm:** CIO issues and articles can be purchased on 16mm and 35mm microfilm and on 105mm microfiche through University Microfilms International, Serials Acquisitions Department, 300 N. Zeeb Road, Ann Arbor, Michigan 48106. **Subscriptions:** Address subscription inquiries to CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208 or call (800) 788-4605. CIO is distributed free of charge to qualified top information executives. To all others, the one-year basic rate for the U.S. and Canada is $94. For rates to other countries, please write the publisher. The single copy price is $7. All subscriptions payable in U.S. funds only. Please allow four to six weeks for new subscriptions to begin. **Change of Address:** Please allow four to six weeks for change of address to take effect. **Postmaster:** Send change of address to CIO, P.O. Box 489, Northbrook, Illinois 60065-9816.

CIO Sales Offices

President and Publisher
JOSEPH L. LEVY
508 935-4601

Director of Marketing
CATHY O'LEARY HAYES
508 935-4521

Inside Sales Rep., List Services
STEPHANIE LEGELIS
508 935-4433

Sales & Marketing Specialist
BRIDGET CAMMARATA
508 935-4035

CIO Publishing Inc.
492 Old Connecticut Path
PO Box 9208
Framingham, MA 01701-9208
508 872-8200, FAX 508 872-0618

NEW ENGLAND AND CENTRAL

Regional Director/Advertising Sales
LINDA L. BURTON
508 935-4039

CIO Publishing Inc.
492 Old Connecticut Path
PO Box 9208
Framingham, MA 01701-9208
508 872-8200, FAX 508 872-0618

EAST COAST

Regional Director/Advertising Sales
MICHAEL J. MASTERS

Regional Manager/Advertising Sales
FRANK S. GENOVESE

Advertising Sales Assistant
PATRICIA GABELMANN

CIO Publishing Inc.
30 Two Bridges Road, Suite 340
Fairfield, NJ 07004
201 227-1140, FAX 201 227-1565

MIDWEST/SOUTH

Regional Director/Advertising Sales
BILL McDONOUGH

Advertising Sales Assistant
CAROL LEE GOCKENBACH

CIO Publishing Inc.
10400 West Higgins Road, Suite 300
Rosemont, IL 60018
708 827-4515, FAX 708 827-9159

WEST COAST

Regional Director/Advertising Sales
GERALD E. PARSONS

Regional Manager/Advertising Sales
RICHARD BASTAS

Advertising Sales Associate
JAY LAMPUS

CIO Publishing Inc.
220 Montgomery Street, Suite 1120
San Francisco, CA 94104
415 398-8200, FAX 415 398-4649

CIO is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 178 computer publications in more than 55 countries. Thirty million people read one or more International Data Group publications each month. International Data Group's publications include: **ARGENTINA'S** Computerworld Argentina, Infoworld Argentina; **ASIA'S** Computerworld Hong Kong, Computerworld Southeast Asia, Computerworld Malaysia; **AUSTRALIA'S** Computerworld Australia, Australian PC World, Australian Macworld, Profit, Information Decisions, Reseller; **AUSTRIA'S** Computerwelt Oesterreich; **BRAZIL'S** DataNews, Mundo IBM, Mundo Unix, PC Mundo, Publish; **BULGARIA'S** Computerworld Bulgaria, EDIworld, PC World Express; **CANADA'S** Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; **CHILE'S** Computerworld, Informatica; **COLOMBIA'S** Computerworld Colombia; **CZECHOSLOVAKIA'S** Computerworld Czechoslovakia, PC World Czechoslovakia; **DENMARK'S** CAD/CAM WORLD, Communications World, Computerworld Danmark, Computerworld Focus, Computerworld Uddannelse, LAN World, LOTUS World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Windows World; **ECUADOR'S** PC World; **EGYPT'S** PC World Middle East; **FINLAND'S** Mikro PC, Tietoviikko, Tietoverkko; **FRANCE'S** Computer Direct, Distributique, GOLDEN MAC, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecoms & Reseaux International; **GERMANY'S** Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, edv aspekte, Information Management, Lotus Welt, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit, Unix Welt; **GREECE'S** Infoworld, PC Games, PC World Greece; **HUNGARY'S** Computerworld SZT, Mikrovilag Magazin, PC World; **INDIA'S** Computers & Communications; **ISRAEL'S** Computerworld Israel, PC World Israel; **ITALY'S** Computerworld Italia, Macworld Italia, Networking Italia, PC World Italia; **JAPAN'S** Computerworld Japan, Macworld Japan, SunWorld Japan; **KENYA'S** East African Computer News; **KOREA'S** Computerworld Korea, Macworld Korea, PC World Korea; **MEXICO'S** Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC Journal, Windows; **THE NETHERLANDS'** Computer! Totaal, Computerworld Netherlands, LAN Magazine, MacWorld; **NEW ZEALAND'S** Computer Listings, Computerworld New Zealand, New Zealand PC World; **NIGERIA'S** PC World Africa; **NORWAY'S** Computerworld Norge, C/world, Lotusworld Norge, Macworld Norge, Networld, PC World Ekspress, PC World Norge, PC World's Product Guide, Publish World, Student Guiden, Unix World, Windowsworld; IDG Direct Response; **PERU'S** PC World; **PEOPLE'S REPUBLIC OF CHINA** China Computerworld, TECH Newproductworld; **PHILLIPPINES'** Computerworld, PC World; **POLAND'S** Computerworld Poland, Komputer; **ROMANIA'S** Infoclub Magazine; **RUSSIA'S** Computerworld-Moscow, PC World, Networks; **SPAIN'S** Amiga World, Autoedicion, CIMWorld, Computerworld Espana, Communicaciones World, Macworld Espana, PC World Espana, Publish; **SWEDEN'S** Affarsekonomi Management, Attack, CAD/CAM World, ComputerSweden, Digital Varlden, Lokala Natverk/LAN, Lotus World, MAC&PC, Macworld, Mikrodatorn, PC World, Publishing & Design (CAP), Unix/Oppna system, DataIngenjoren, Maxi Data,Windows; **SWITZERLAND'S** Computerworld Schweiz, Macworld Schweiz, PC & Workstation; **TAIWAN'S** Computerworld Taiwan, PC World Taiwan; **THAILAND'S** Thai Computerworld; **TURKEY'S** Computerworld Monitor, Macworld Turkiye, PC World Turkiye; **UNITED KINGDOM'S** Lotus Magazine, Macworld; **UNITED STATES'** AmigaWorld, Cable in the Classroom, CIO, Computer Buying World, Computerworld, Digital News, DOS Resource Guide, Electronic News, Federal Computer Week, GamePro, inCider/A+, IDG Books, InfoWorld, Lotus, Macworld, Momentum, MPC World, Network World, NeXTWORLD, PC Games, PC World, PC Letter, Publish, RUN, SunWorld, SWATPro; **VENEZUELA'S** Computerworld Venezuela, MicroComputerworld Venezuela; **YUGOSLAVIA'S** Moj Mikro

FYI

Lights, Projector, Action!

Need to spice up your presentations? With Proxima Corp.'s Ovation sx, you can add true-color, large-screen images and animation from a variety of personal computers. The product's optional digital video adapter also enables users to project video from VCRs, TVs, laser-disk players or camcorders. It automatically detects the computer video standard to which it is connected and supports NTSC, PAL and SECAM video signals.

Ovation sx is designed for presenters using standard PC or Macintosh software, such as Harvard Graphics, Excel and WordPerfect. It is a more accessible version of parent product Ovation, which offers 10 times the colors and integrated video for users who need photographic-quality images, 3-D modeling or multimedia presentations.

Ovation sx weighs less than six pounds and is compatible with the Proxima Cyclops interactive pointer which enables presenters to operate software and control the presentation directly from the projected image. Retail price is $6,200. The optional video adapter is $695. For more information call 619 457-5500.

Mail Models

Devoted users of E-mail have long applied it as a flexible, albeit imperfect, substitute for productivity tools they wished they had but didn't. Now E-mail vendors are beginning to make explicit in their products the kinds of workgroup- and personal-productivity features that were heretofore user-improvised.

Consider PC-based BeyondMail, from Beyond Inc. of Cambridge, Mass. BeyondMail does the usual E-mailish stuff, but it also allows users to program "rules" that will trigger specific actions when predefined conditions occur. It can be used to file and prioritize messages based on user-defined criteria. And since it can function as a front end from which to invoke other applications, BeyondMail can also tackle more complex actions. For example, a script can be written so that if your CFO sends a message asking for current contract-programming budget figures, BeyondMail will automatically link with your spreadsheet application and fire back the relevant data.

A starter pack, including 10 user licenses, retails for $995. Call 617 621-0096.

Tolerant to a Fault

Answering customer demands for more-fault-tolerant systems, Data General Corp. endowed its sixth-generation Eclipse/MV midrange machines with redundant power and cooling components and online diagnostic capabilities. Both the recently introduced high-end MV/60000 and midrange MV/35000 models can isolate and deconfigure a failed component and automatically reboot themselves.

Both boxes are multiprocessor systems. Depending on how many processors are installed, the 60000 can deliver 27 million to 108 million instructions per second, doubling the capability of the MV/40000. The new 35000, with one to six processors, can output from 9 MIPS to 54 MIPS.

DG also announced a disk array for the Eclipses that can be repaired without powering down and can continue operating without data loss if one drive or bus fails. The array accommodates from 2.5G to 30G of storage.

Prices for the hardware start at $750,000 for the 60000, $177,000 for the 35000 and $42,000 for the disk array. For more information call 508 366-8911.

The Compleat Client/Server

Sired by a company whose lifeblood is providing electronic access to information, Dun & Bradstreet Software is trying to help its customers make the most of their information, regardless of its form and where it resides. In March the company introduced a computing environment, a line of application and development products, and an array of consulting services for D&B customers who wish to begin leveraging the benefits of client/server computing.

The Windows-based SmartStream, according to the company, is the first environment to serve as a single source of access to information located in a variety of internal and common external databases. SmartStream, aided by a middleware component called InterQ and a decision-support application called Financial Stream Analysis, uses intelligent "agents" to access, analyze, filter and distribute data across a network, according to the individual user's needs. The products are designed to work with D&B's current products, as well as with development tools from Cognos, Powersoft and Sybase.

The accompanying suite of consulting services includes business reengineering, network planning and configuration, enterprise modeling and implementation workshops for moving to client/server.

Prices for an integrated package start at $99,000. Call 404 239-2000.

Getting Editors Off the Hook

Commercial editors at CBS were spending as much time fielding phone calls from ad agencies as they were editing copy. An interactive voice-response system keeps anxious agency personnel apprised of their materials' status while letting editors get on with the business at hand.

The telephone can be as much a hindrance as a help. Just ask anyone trying to concentrate in the presence of one that is incessantly ringing. Yet ignoring a call might mean alienating the person on the other end—not a good idea if that person is a customer.

Commercial editors at CBS were constantly distracted from their real work—editing commercials—by incoming calls from their advertising-agency clients. Now that an interactive voice-response system lets agency staff get information via a touch-tone keypad, the editing process has become more efficient. This has given CBS an edge over the other networks in instances where such factors as the price of air time, ratings of shows and demographics of the audiences are equal.

Before they can be broadcast, commercials must meet the network's standards of truth and taste. Agencies submit either scripts or storyboards to CBS's program practices department, where editors review the materials and advise the agencies on any changes they should make. During the process, agency personnel need frequent updates on a commercial's status for their own clients. CBS receives 50,000 submissions annually, so there's a lot of communication among the network, agencies and advertisers.

Whenever a commercial's status changes, an editor inputs the information on a PC that uploads it to a mainframe. Previously, a fax detailing the changes was automatically sent to the agency involved, but according to Vice President of MIS Jim Halsey, this did little to discourage anxious agency staff from calling as broadcast time approached. "It was a psychological issue," he said. "It's one thing to wait for a fax and another to be proactive and inquire."

Matthew Margo, vice president of program practices, realized that many calls were requests for routine information that could be provided through a voice-response system. "Editors were regularly interrupted, and this impaired efficiency," Margo said. "We needed to reduce turnaround time [for getting approvals back] to clients."

Late last year, Halsey selected the EZCheck voice-response system from Octel Communications Corp. of Milpitas, Calif. The voice-processing server consists of the Maxum voice-processing module and Unix PC-based 500D data module. Octel's TransAct software provides interaction with the CICS VSAM-based database on the mainframe. Now agencies punch in the appropriate passwords and codes to receive voice-generated updates. And the system works better than faxes because agency staff can access information even if business hours are over or they are away from the office. If questions remain, messages are forwarded to an editor's voice mailbox.

According to Margo, the reduction in incoming calls has substantially boosted editor efficiency and morale. As of April, 72 agencies were signed up on EZCheck, and Margo said the response has been overwhelmingly positive.

Both Margo and Halsey believe EZCheck has become a competitive weapon for CBS. "Many media buyers have said that [in cases where they can] buy from only one network, . . . hearing from us first would influence their buying decision," Margo said. Halsey added that agencies like the independence EZCheck gives them because they don't have to be "spoon-fed information by editors."

Once skeptical of technology, Margo has been sold by EZCheck. "I can't speak warmly enough of Jim Halsey and the MIS department," he said. "I now have a real commitment to work closely with them to use technology to enhance the way we do business."

–Megan Santosus

VITAL STATISTICS

Organization: *CBS Inc., New York*

Application: *EZCheck interactive voice-response system*

Technologies: *A voice information-processing server and software from Octel Communications Corp. integrated with an IBM 3090 mainframe*

Scope: *CBS's program practices department and external clients*

Sponsor: *Matthew Margo, vice president of program practices*

Objective: *To reduce the number of phone inquiries handled by commercial editors*

Payoff: *Increased efficiency, improved customer satisfaction and enhanced competitive position*

STOP

Before you "bet your business" on another dial modem...

Consider this:

PC
MAGAZINE
EDITORS' CHOICE
March 17, 1992
AT&T Paradyne COMSPHERE 3810

"If you have LAN-to-LAN, public information service, or other "bet-the-business" communications applications, this is the modem to buy."
--PC Magazine

AT&T Paradyne's COMSPHERE® 3800 Series dial modem family is now priced from **$795**. The COMSPHERE 3810 modem was winner of the 1992 PC Magazine Editors' Choice® Award. Good reasons to give the family serious consideration before you buy.

Consider quality. As *PC Magazine* put it, "the COMSPHERE worked for us every time over every line with every other modem."

Consider investment protection. Upgrades and enhancements can be downloaded over the telephone line--allowing you to quickly adapt your network to new business applications.

Finally, consider value. The **$795** price tag for the new COMSPHERE 3830 modem makes it the best V.32bis value on the market.

So if you're considering dial modems, we'll make it quick and easy for you. For more information on the award-winning COMSPHERE 3800 Series V.32bis family, call **800 482-3333, ext. 555**.
Or fax us at **813 530-2103**.

Visit us at ComNet West booth #854

AT&T Paradyne

PC MAGAZINE EDITORS' CHOICE LOGO, Copyright © 1985 Ziff Communications Company
PC MAGAZINE and PC MAGAZINE EDITORS' CHOICE are registered trademarks of Ziff Communications Company
COMSPHERE is a registered trademark of AT&T

Where are you headed with your applications development?

BACHMAN Model Driven Development puts you on the right course for increased software productivity.

It's never been easy to know which direction to take in applications development. Navigating in a changing environment makes setting a course difficult.

That's why you need to talk with BACHMAN. We have a clear vision of how you can get from where you are to where you want to be. BACHMAN's unique development approach allows you to build new applications – quickly and successfully – and still leverage your investment in your current systems.

With BACHMAN Model Driven Development, you assure yourself of the right heading – year after year- no matter what challenges you may encounter.

Call BACHMAN and start charting your new course today.

BACHMAN

1-800-BACHMAN

In Canada, call 1 800 445 0854

GSA# GS00K92AGS5990